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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

Volume XXXI JANUARY, 1938 Number 5

A SCALE FOR EVALUATION OF PUPILS' JUDGMENTS ON BEST-LIKED AND LEAST-LIKED ASPECTS OF SECONDARY SCHOOLS

KENNETH W. EELLS

Statistician, Cooperative Study of Secondary School Standards, Washington, D. C.

THE Cooperative Study of Secondary School Standards has been engaged during the past year in an intensive study of all phases of the work and equipment of 200 carefully selected secondary schools in all parts of the country. These schools were chosen on a proportional basis so as to take into consideration the following features: geographical distribution, control, enrollment, racial groups served, form of organization, type of community served, type of program offered, sex of pupils enrolled, denominational control, and boarding or day school status. Of the entire group, 168 are public schools, 32 are private; 175 are accredited, 25 are not thus recognized. The number of schools per state varies from one to twelve.

As part of the program for evaluating these schools over 20,000 of their present and former pupils were asked to indicate their judgment on various aspects of their school's program. As one phase of this study, it was desired also to obtain a general judgment concerning the entire school on the part of each of these pupils. This might have been done by any one of several techniques. First, the pupils might have been asked to indicate on a linear scale the degree of their general satisfaction with their school experience. Second, they might have been given a list of significant items characterizing a good school and have been asked to check those which they felt were present, or absent, in their own school. Third, they might have been asked to state in their own words what they liked best and liked least about their school.

The advantages of the first method, use of a linear scale of degree of satisfaction, are that it permits expression in a single judgment of the attitude of the pupil and such pupil judgments may be easily summarized statistically. The chief disadvantages are that it is very general, and that

it perhaps calls for a perspective possessed by but very few secondary school pupils, most of whom know no other schools with which to compare their own. The advantages of the second method, a check-list of good features of a school, are that it suggests points to be considered which might otherwise have been forgotten, and that judgments expressed by pupils may be summarized by comparatively simple statistical procedures. Its main disadvantage is that it directs the pupil's thinking into the channels suggested by the compiler of the checklist. The advantage of the third method, unguided indication of the best-liked and least-liked features of the school, is that it measures the school at both extremes rather than only at the middle or average point, and that it is a completely undirected evaluation on the part of the pupil. The chief disadvantage is the difficulty involved in summarizing in a useful form the subjective replies of a large number of pupils when given in this form. If this disadvantage can be satisfactorily overcome, the method should prove of decided value to administrators and other investigators in evaluating the judgments of pupils and graduates and perhaps even of staff members, parents, patrons, and other groups.

The Cooperative Study has used the first and third of these methods. It is the purpose of this article to present the scale which was developed to summarize the unguided responses of approximately 17,300 present pupils and of nearly 7,000 former pupils to the following two questions:

"What do you like *best* about your school?"
"What do you like *least* about your school?"

TABULATION OF THE REPLIES

Upon inspection of the responses, it was apparent that they could be classified, without doing serious violence to the pupils' meanings, into about 250 different classes. These responses were grouped into twelve main classes and 42 sub-classes. The main groups were as follows:

a. The school staff
b. The pupil population
c. The pupil activity program
d. The curriculum and courses of study
e. Instruction
f. Administration
g. Outcomes of the school program
h. Plant and equipment
i. Library
j. Guidance

k. Miscellaneous
l. Non-evaluative replies

The sub-divisions and individual items, as finally revised, appear in the Scale which is included as part of this article. The replies were coded for punching on Hollerith tabulating cards. After a preliminary summary of the frequencies of each of the replies, those items with fewer than five replies were combined with other related items or put into the miscellaneous classifications.

EVALUATION OF THE REPLIES

In order to evaluate these replies, even when classified, it was necessary to arrive at some determination of which items were of greater, and which were of lesser, significance as judgments or criticisms of the school. To accomplish this, the entire list was sent to twenty-three educators connected with the Coöperative Study. This group was composed of eleven members of the Executive Committee of the Study, eight members of the Field Committees which had just completed a year of visiting and studying the 200 coöperating schools, and three members of the office staff of the Study.

The instructions accompanying the list were as follows:

On the attached page is a classified list of the responses of over 20,000 present and former high school pupils to the questions "What do you like *best* about your school" and "What do you like *least* about your school?" The items on the left side of the pages are those liked best, while those on the right side are those liked least. Most of the items occur in pairs, some pupils liking the feature and others disliking it.

You are asked to indicate in the blanks in the middle of each page your best judgment as to the importance of each item *as an evaluation of the school*. In assigning weights to the different items, please use the following five-point scale:

5—extremely important
4—very important
3—of average importance
2—somewhat important
1—of little or no importance

Seven types of responses received which do not seem to be usable as evaluations of the school have been placed at the end of the list, under "Non-evaluative answers." If there are other items which you feel represent neither praise of a school nor reflection upon it, mark them with an "M."

In general, it is assumed that the "best-liked" and "least-liked" aspect of each item will receive the same weighting. If, however, you feel in some cases that the recognition of the presence of a feature is more, or less important than recognition of its absence, you may mark the item with two weights. The first will apply to the "best-liked" aspect of the item and the second to the "least-liked" aspect.

In assigning these weights, please keep in mind the following considerations:

1. We are trying to secure a valid method of evaluating the schools, not the pupils.
2. Weight the items for their importance as indications of the quality of the school as a whole; e.g., a pupil's indication that the best feature of a school is the curriculum as a whole probably represents greater praise of a school than a similar indication that the best feature is a particular English course.
3. Consider how much the pupil is likely to know about the item; e.g., a pupil's comment on pupil activities is probably more reliable than one about the school board.
4. Consider the likelihood of the pupil's giving a particular answer. For example, it is to be expected that a large number of pupils will think of sports or other activities when asked what is the best feature of the school. On the other hand, if a pupil says that the library, or the guidance program, is the best thing, it is likely to indicate that that feature is rather outstanding.

Twenty-one replies were received out of the twenty-three requested.

Although the judges had been invited to assign different weights to the "best-liked" aspect and "least-liked" aspect of any response if they felt that such a difference was desirable, only eight judges used this type of weighting; there was only one item to which as many as three judges assigned a double weight.

As was to be expected, the twenty-one judges differed somewhat in their judgments, the means of their weights varying from 1.9 for one judge to 3.9 for another. The mean for the entire group was 2.9, just slightly below the point defined as "of average importance." The mean weight for fifteen of the twenty-one judges fell within 0.4 of this value, or between 2.5 and 3.3.

The means of the weights assigned to each item by the three groups of judges—Executive Committee, Field Committee, office staff—were computed separately, but were found not to differ markedly from each other on most items. The maximum difference between the group of judges assigning highest ratings and the group assigning lowest ratings on any single item was 1.7, but only eight percent of the items had dif-

ferences in excess of one full point between the groups of judges giving highest and lowest ratings. The average difference was 0.6.

The means of the weights assigned by the entire group of judges on each of the 225 items ranged from 1.3 to 4.3, with a mean of 2.9. The standard deviation of these mean weights was 0.7. The mean weights were arranged in order and separated into five classes, at intervals of one standard deviation, beginning one-half standard deviation on either side of the mean. This gives a distribution which is very close to that given by the normal probability curve:

Mean Weights	Actual	Normal	Class Value
3.0 and over	6.2%	6.7%	5
2.3 – 2.9	25.3%	24.2%	4
1.6 – 2.2	37.3%	38.2%	3
1.0 – 1.5	24.5%	24.2%	2
0.9 and under	6.7%	6.7%	1
	100.0%	100.0%	

Finally, class values ranging from one to five were assigned to the five classes, as indicated in the last column.

A class value of "O" was assigned to the seven "Non-evaluative" responses which appear at the end of the scale. Although the judges were invited to indicate additional items that should be considered as useless for evaluation purposes, only five of the twenty-one judges made any such indication; on only two of the 225 responses evaluated did as many as three judges agree that it should be considered as non-evaluative. These votes were counted as weights of "O" in computing the mean weights for each item.

RELIABILITY OF THE CODING AND THE SCALE

The usefulness of the scale as derived depends, of course, upon its reliability and the reliability of the factors comprising it.

Considerable judgment is involved in classifying some of the original responses of the pupils into the 225 items listed on the scale. A statement by the pupil that the best feature of the school is "personal interest of the teachers in the pupil" might seem to one person to belong under Code No. 042, (See following Scale) as "Qualities of the teachers: insight and understanding" and to another, or to the same person at another time, to belong under Code No. 432, as "Methods of teaching: individual attention from teachers." To test the reliability of this translation of the pupil's original response into a code number, a typical school's responses were coded three times: (1) by a person familiar with the code, (2) by the same person, six weeks later; (3) by a second per-

son, entirely unfamiliar with the code. A total of 197 items were thus coded three times independently. Of these, 84 percent were coded identically in each of the three codings; only one percent were classified in three different ways by three codings.

Between the two codings by the same person, six weeks apart, 92.4 percent were coded identically, and in only 5.6 percent of the cases was the discrepancy great enough to shift the pupil's responses from one subdivision of the scale to another. In only 1.5 percent of the cases did the response shift from one main classification to another. It would seem, therefore, that the translation of free subjective responses into an objective classification of this type can be accomplished with a satisfactory degree of reliability.

Between two codings, one by a person who had used the code in over 24,000 cases and the other by a person who had never seen the code before, 86.8 percent of the items were classified identically. Differences in classification were great enough in 8.1 percent of the cases to move the item from one subdivision to another, and in 5.1 percent of the cases to shift the item into a different main group. This would indicate that, while it is better for the code and scale to be applied by someone familiar with it, the principal of a school who has never seen the scale can use it with a reasonable expectation of obtaining comparable results.

The reliability of the five class values assigned to the different items is indicated by the probable errors of each of the main weights. These were not computed for all 225 items, but were computed for eleven of them, selected at half standard-deviation intervals from the mean, so as to be typical of the entire range of responses. The probable errors of these eleven mean weights ranged from .09 to .15, with an average of .12. Since the class interval used in assigning the class values was .66, or five and a half times the average probable error of the means, the chances of a particular mean weight varying by as much as a class interval are considerably less than one in a thousand, (.0002). Since any mean weight would have to shift at least one class interval, and usually more, to change its final weight by more than one point, the chances of this occurrence are practically negligible. Of course the final weight for certain items might vary by one point, in cases in which the placement of items is near the boundaries between the five classes used for the scale.

USE OF THE SCALE

The Cooperative Study Scale, as it appears at the end of this article, includes a Hollerith code number for each item, which will be found con-

venient whether the data is to be analyzed by machine or by hand. The first digit of each number represents the twelve main classes into which the items are grouped: All the 000's, for instance, have to do with the school staff, the 100's with pupil population, etc. The second digit represents the subdivision to which the item belongs; the 020's all represent teachers in general, the 030's, 040's and 050's represent qualities of the teachers. The third digit identifies the particular response. If Hollerith machine analysis is used, the class value can be punched in the fourth column of the card. This plan makes available a maximum of information with a minimum of effort, especially where a large number of cases are being analyzed. Sorting, whether by machine or by hand, of the first digit gives a tabulation of the frequency with which the main fields are mentioned. For certain purposes this may be all that is desired. Sorting on the second digit similarly will give a tabulation by the subdivisions. On the other hand, if a final score only is desired, without any tabulation of frequencies of particular answers, sorting by the class values alone is sufficient.

A school score is derived by analyzing completely the best-liked features, then repeating the process for the least-liked measures. Each answer to the question as to the best-liked feature in school carries a positive weight equal to the class value of the item mentioned. Likewise an answer to the question as to the least-liked feature carries a negative weight equal to the class value of the item mentioned. In this way two pupils who list two features of the school, one as best-liked and one as least-liked, which are of equal importance as indicated by their class values, have no net effect on the school score. A school can accumulate a postive score only if its best features, as seen by its pupils, are more important than its poorest features. The total positive score—which is, of course, the total of the class values assigned to the answers of the first question—minus the total negative score gives a net score for the school. If comparisons between schools or between groups of schools are to be made, this score should be divided by the number of pupils answering to allow for the difference in number of pupil responses in the different schools. The result will be a figure indicating the average evaluation of a school by its pupils, as derived from their judgments as to the best-liked and least-liked features of the school.

An application of this scale to the 200 cooperating schools of the Co-operative Study, including norms for different types of schools, will be presented after analysis of the data has been completed.

COOPERATIVE STUDY SCALE FOR EVALUATION OF RESPONSES OF PUPILS AS TO BEST-LIKED AND LEAST-LIKED FEATURE OF SCHOOL

SCHOOL STAFF

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
The principal	4	011	*The principal*
The teachers			*The teachers*
The teachers	5	021	The teachers
Most or some of the teachers	4	022	Most or some of the teachers
A particular teacher	1	023	A particular teacher
	4	024	Inadequacy of the staff
Coöperation among the staff	4	025	Lack of coöperation among the staff
	3	026	The teachers run everything
Qualities of the teachers			*Qualities of the teachers*
Fairness	4	031	Partiality, favoritism, prejudice
Helpfulness	4	032	Lack of helpfulness
Friendliness	4	033	Lack of friendliness
Coöperativeness (with pupils)	4	034	Lack of coöperativeness (with pupils)
Youth of the teachers	3	035	Old age of the teachers; teachers too old
Interest in pupils	5	036	Lack of interest in pupils
Strictness	2	037	Strictness
Informality	2	038	Formality, impersonalness
Pleasantness	3	039	
Broadmindedness	4	041	Narrow-mindedness
Insight and understanding	4	042	
Courtesy	4	043	Lack of courtesy
Efficiency	4	044	Inefficiency
Preparation	4	045	Poor preparation
Reasonableness	3	046	Unreasonableness
Patience	4	047	Impatience
	2	048	Too personal
	2	049	Fussiness
	2	051	Snobbishness
	3	052	Sarcasm
	3	053	Tempers
The janitor	2	071	*The janitor*

PUPIL POPULATION

General			*General*
The pupils, the type of pupils	3	111	The pupils, the type of pupils
Some of the pupils	2	112	Some of the pupils
Attitude or spirit of some pupils	3	113	Attitude or spirit of some pupils
My friends	2	114	My friends
Making friends	3	115	Lack of friends
The cadets	1	116	
The opposite sex	2	117	Too many of the opposite sex

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
Grouping of pupils			*Grouping of pupils*
That it is coeducational	2	131	That it is coeducational
That it is not coeducational	2	132	That it is not coeducational
	2	133	Grade school, junior high, or junior college students in same building
	1	134	Town and boarding students together
Absence of foreigners	1	135	Foreigners
	1	136	Negroes; mixing of colored race
Good attitude toward Negroes	2	137	Prejudice against Negroes
Qualities of pupils			*Qualities of pupils*
School spirit	5	151	Lack of school spirit
Friendliness	4	152	Unfriendliness
Good conduct	4	153	Poor conduct
Democraticness	4	154	Snobbishness
	3	155	Cliquishness
Coöperativeness	4	156	Lack of coöperativeness
Sportsmanship	4	157	Lack of sportsmanship
Sociability	4	158	Lack of sociability
Honesty	4	159	Dishonesty
	2	161	Gossiping
	2	162	Jealousy
	2	163	Conceitedness
PUPIL ACTIVITY PROGRAM			
General			*General*
Activities	5	211	Activities
Some of the activities	3	212	Some of the activities
Clubs	3	213	Clubs
Specified activities: athletic			*Specified activities: athletic*
Sports or athletics	3	221	Sports or athletics
Football	2	222	Football
Baseball	2	223	Baseball
Basketball	2	224	Basketball
Swimming	2	225	Swimming
Track	2	226	Track
Tennis	2	227	Tennis
Miscellaneous	2	228	Miscellaneous
Specified activities: non-athletic			*Specified activities: non-athletic*
Social activities (including dances and parties)	3	241	Social activities (including dances and parties)
Musical activities	3	242	Musical activities
Dramatic activities	4	243	Dramatic activities
Publications	3	244	Publications
Hi-Y, Girl Reserves, etc.	3	245	Hi-Y, Girl Reserves, etc.
Assembly programs	3	246	Assembly programs
Chapel programs	3	247	Chapel programs
Miscellaneous	2	248	Miscellaneous

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
Adequacy and scope of activities			*Adequacy and scope of activities*
	4	261	Too many activities or too much stress on activities
	3	262	Too much stress on a particular activity
Wide choice and variety.....	4	263	Narrow choice; not enough activities
Adequacy of sports program....	3	264	Not enough sports activities
Adequacy of social activities....	3	265	Not enough social activities
	3	266	Not enough musical activities
	3	267	Not enough assemblies
	2	268	Not enough chapels
	2	269	Not enough of some other activity
Management of activities			*Management of activities*
The way they are run.....	4	281	The way they are run
Participation by school authorities	3	282	Interference by school authorities
Student government	4	283	No or poor student government
	4	284	Domination of a small group of pupils in running the school
Participation in activities			*Participation in activities*
Wide pupil participation.....	5	291	Failure of most students to participate
My participation	3	292	My failure to participate
	3	293	Enforced participation in activities
	3	294	Enforced participation in athletic activities

CURRICULUM AND COURSES OF STUDY

General			*General*
The courses, the classes.....	5	311	The courses, the classes
Some of the classes.....	3	312	Some of the classes
Academic courses	4	313	Academic courses
Vocational-training courses....	4	314	
Adequacy and scope of offerings			*Adequacy and scope of offerings*
Wide choice and variety.....	5	331	Narrow choice
Well-balanced offerings	5	332	Not enough or too much stress on a named subject
	4	333	Not enough stress on vocational-training or other non-college preparatory work
Specific subjects			*Specific subjects*
English	3	351	English
Language	3	352	Language
Mathematics	3	353	Mathematics
Science	3	354	Science
Social science: history.....	3	355	Social science: history
Social science: non-history.....	3	356	Social science: non-history
Fine arts	3	357	Fine arts
Practical arts	3	358	Practical arts
Commercial	3	359	Commercial
Miscellaneous	2	361	Miscellaneous

INSTRUCTION

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
General			*General*
Method of teaching	5	411	Method of teaching
Method of teaching of some teachers	3	412	Method of teaching of some teachers
Small classes	3	413	Large classes
Specific methods of teaching			*Specific methods of teaching*
Modern methods	4	431	Old-fashioned methods
Individual attention from teachers	4	432	Not enough individual attention
Class discussion and recitation	4	433	Class discussion and recitation
	3	434	Examinations, tests, and studying for them
	2	435	Too many examinations and tests
Method and fairness of grading	3	436	Method and fairness of grading
Miscellaneous	2	437	Miscellaneous
Studying			*Studying*
Studying and homework	4	451	Studying and homework
Study halls or study periods	3	452	Study halls or study periods
Supervised study system	4	453	
Easiness of work	3	454	Too much or too difficult home work
That I studied enough	2	455	That I didn't study enough
Method of teaching specific subjects			*Method of teaching specific subjects*
English	3	471	English
Language	3	472	Language
Mathematics	3	473	Mathematics
Science	3	474	Science
Social science: history	3	475	Social science: history
Social science: non-history	3	476	Social science: non-history
Fine arts	2	477	Fine arts
Practical arts	2	478	Practical arts
Commercial	2	479	Commercial
Miscellaneous	2	47X	Miscellaneous

ADMINISTRATION

General			*General*
The system, the way it is run	3	511	The system, the way it is run
Efficient way in which it is run	4	512	Inefficient way in which it is run
School board	2	531	*School board*
Discipline, regulation, freedom, etc.			*Discipline, regulation, freedom, etc.*
Freedom allowed the pupils	3	541	Not strict enough, too much freedom
Freedom of expression and thought	4	542	Not enough freedom of expression and thought
Enough time allowed for study	4	543	Not enough time allowed for study
Enough time allowed for leisure, recreation and activities	3	544	Not enough time allowed for leisure, recreation and activities
Privileges allowed	3	545	Not enough privileges allowed

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
Strictness of discipline.....	3	546	Too much supervision, too much discipline, too strict
The rules	3	547	The rules
Some rules, certain rules.....	2	548	Some rules, certain rules
A particular rule.....	1	549	A particular rule
Uniform dress requirements.....	1	551	Uniform dress requirements
	2	552	Detention system; staying after school
	2	553	Hall discipline system
	2	554	Demerit system
Miscellaneous			*Miscellaneous*
Enough years in school.....	2	571	Not enough years in school
Length of school year.....	2	572	Length of school year
Length of school day.....	2	573	Length of school day
Length of class period.....	3	574	Length of class period
Length of lunch or recesses.....	2	575	Length of lunch or recesses
Class schedule, arrangement of classes	3	576	Class schedule, arrangement of classes
Credit system	3	577	Credit system
Pass system	2	578	Pass system
Bus system, using busses.....	2	579	Bus system, using busses
Vacations	1	581	Vacations
Recesses or lunch.....	1	582	Recesses or lunch
Miscellaneous	1	583	Miscellaneous
		OUTCOMES	
General			*General*
It gives a good education and prepares for life.....	5	611	It doesn't give a good education and doesn't prepare for life
We really learn something.....	4	612	We don't learn anything
We learn more than at other schools	3	613	
Opportunity for studying.....	3	614	
Opportunity to get a high school education	2	615	
Academic			*Academic*
It fits one for college, and for further study	4	631	It does not prepare adequately for college
It enables one to get into any college	3	632	
Teaches one how to study.....	4	633	Doesn't teach one how to study
Teaches one how to think.....	4	634	
Other			*Other*
Good vocational training.....	4	651	Poor vocational training
Cultural development	3	652	
Development of attitudes.....	4	653	
Development of character and personality	4	654	

PLANT AND EQUIPMENT

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
General building			*General building*
The building, the rooms	3	711	The building, the rooms
Arrangement of the rooms	3	712	Arrangement of the rooms
Roominess of the building	3	713	Crowdedness of the building
Cleanliness of the building	4	714	Dirtiness of the building
The auditorium	3	715	Inadequacy or lack of auditorium
General equipment			*General equipment*
The equipment	4	731	The equipment
	3	732	Not enough equipment
Free supply of books, paper, etc.	2	733	Have to buy or rent books, etc.
Athletic buildings and equipment			*Athletic buildings and equipment*
General	3	751	General
Swimming pool	2	752	
Gymnasium	3	753	Gymnasium
	3	754	Lack of gymnasium
Athletic field	3	755	
Playground	3	756	
The site			*The site*
The surroundings; the campus	3	771	The surroundings; the campus
Large campus	3	772	Campus too small
Location			*Location*
The location	3	791	The location
Closeness to home	2	792	Distance from home

LIBRARY

The library	5	811	The library
The librarian	4	812	The librarian
Books and magazines	5	813	Not enough books and magazines
	4	814	Inadequacy of the library
	4	815	Unavailability of material

GUIDANCE

General	5	911	*General*
Vocational Guidance			*Vocational Guidance*
Vocational guidance	5	921	Vocational guidance
	4	922	Not enough vocational guidance
School obtains jobs for students.	3	923	School doesn't obtain jobs for students
Educational guidance			*Educational guidance*
I took the right courses	4	941	I didn't take the right courses
Compulsory courses	3	942	Compulsory courses
Freedom to elect subjects	3	943	A particular course was not compulsory
	2	944	Compulsory physical education
	2	945	I didn't finish school, when I could have

MISCELLANEOUS

Best-Liked Feature of School	Class Value	Hollerith Code No.	Least-Liked Feature of School
Reputation			*Reputation*
Good reputation, ranks high	3	X11	Poor reputation, ranks low
Good sports reputation	2	X12	
High scholastic standards	4	X13	Low scholastic standards
Atmosphere			*Atmosphere*
Friendliness (of teachers and pupils)	4	X21	Unfriendliness (of teachers and pupils)
Cooperativeness (of teachers and pupils)	5	X22	Lack of cooperativeness (of teachers and pupils)
High moral standards	4	X23	Low moral standards
Religious atmosphere	3	X24	Not enough religious atmosphere
	2	X25	Too much religious atmosphere
Miscellaneous	1	X26	Miscellaneous
Size			*Size*
Smallness of school	2	X41	Smallness of school
Largeness of school	2	X42	Largeness of school
Private school conditions			*Private school conditions*
Lack of tuition	2	X51	Too expensive
Food and meals	3	X52	Food and meals
Dormitories and dormitory life	3	X53	Dormitories and dormitory life
	1	X54	Rising or retiring time
Going home	1	X55	Not getting home often or long enough
Off-campus permits	1	X56	Not enough off-campus permits
	3	X57	Confinement of school; lack of contact with outside world
Conditions for earning expenses	2	X71	*Conditions for earning expenses*

NON-EVALUATIVE ANSWERS

Illegible or so general as to be meaningless and unclassifiable	0	Y11	Illegible or so general as to be meaningless and unclassifiable
"Funnyisms"	0	Y12	"Funnyisms"
Nothing	0	Y13	Nothing
Everything	0	Y14	Everything
Don't know	0	Y15	Don't know
Features for which student or his family alone responsible	0	Y16	Features for which student or his family alone responsible
Blank; no answer	0	Y17	Blank; no answer

AN EXPERIMENTAL STUDY OF THE VALUE OF INFORMAL METHODS IN TEACHING PRIMARY READING

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ONE of the major objectives of the new curriculum is to make use of life situations so that the child not only gains experience in living, but is motivated by the necessity to learn. The merits of this new program have been discussed widely by various educators, and there appear obvious advantages in placing teaching emphasis on problems having social values rather than on isolated facts. Play activities in the form of "projects" commonly serve as the medium of instruction in the more progressive schools. Many teachers are using various types of games which serve as good teaching devices: Woody (28) suggests Dominoes, Parchesi and Lotto as good number experiences in the lower grades; and Bingo, Old Maids, and Anagrams are used in some schools. Hooper and Stratton (12) find Ring Toss, Bean Bag, Peggity, Peter Rabbit, Jack Straws, Winnie-the-Pooh, Tom Mix Circus, etc., successful in grades I and II. Since these games are part of the child's actual environment they furnish excellent material for school experiences; they are, however, limited in teaching possibilities and are not easily integrated into the various phases of the new curriculum.

During the past year there has appeared a series of games especially adapted to the requirements for supplementary material that teaches through play.* In order to determine the efficiency of these games as well as to make an objective analysis of the value of informal activities in academic instruction, we have undertaken several experiments. The following discussion outlines an experiment to improve reading through the use of educational games.

The READ-O games are built from Gates' Vocabulary List for Primary Grades arranged throughout the series according to frequency; IA contains the 72 words most commonly used, IB the 72 next most common, IC the next 72, etc., so that the whole series uses 432 words from the first 500 in Gates' list. As some of the 500 are duplicated because of Gates' arrangement according to the different parts of speech, the 432 different words in the READ-O games cover practically all of Gates' first

* READ-O, Series IA and IB, first half Grade I
READ-O, Series IC and ID, second half Grade I
READ-O, Series IIA and IIB, Grade II
Augsburg Publishing Co., Morristown, Tennessee

five hundred. Series IA, consisting of the first 72 words most frequently used, was used for this experiment.

The game is based on a flashcard technique. The teacher presents one flashcard at a time, calls the word, and uses it in a sentence taken from the context of the children's reading material. Each child plays on an individual card which has sixteen of the 72 words arranged in four vertical and horizontal rows. No two playing cards are alike and the 72 words are distributed equally over the forty-five children's cards. As the teacher presents a flashcard, each child looks over the sixteen words on his card, and if he finds the word which has been presented, he puts a token over that word. The first child to get four tokens in a row calls out "READ-O." The teacher and pupils then check the child for accuracy by having him read the four words in the row he has completed. If they check with the flashcards which are displayed in the flashcard holder, the child wins the game. Through the game the children learn recognition and meaning of words, and also phrase, clause and sentence building, all of which may be closely associated with their other reading materials. Because of the large degree of active participation by each child in the group, the constant frequency in the repetition of the words, and the general construction of the game, READ-O readily lends itself to experimentation both for studying the learning processes and for formulating word lists based on difficulty.

Data for this experiment were gathered during twenty consecutive school days in October and November, 1936, from 227 children who had entered grade IB the previous September. Six different public schools in various sections of Johnson City, Tennessee, and the Training School of the Teachers College were selected in an attempt to get a fairly accurate sampling of schools in this vicinity. Seven teachers, with four years college training and several years experience, were chosen as representing the average public school teacher in our city systems. The classes were divided into experimental and control groups according to intelligence rating on Dearborn IA Tests. Where a teacher had two sections, one was put into the control group and one into the experimental so as to equalize as much as possible any differences due to personalities and particular methods of the teachers. Also the experimental and control groups were equally divided between afternoon and morning sessions so that time of day would not influence the final results. Because we wanted to determine the value of this play technique when used by the average teacher in the average school, no attempt was made to supervise

or assist the teachers in any way other than instructing them as to the general procedure of playing the game with the experimental groups. In the experimental group READ-O was played twenty minutes a day during part of the regular reading period. Otherwise both groups received the same type of instruction. The coöperation of all the teachers was excellent.

As there are no adequate standardized vocabulary tests available to test first grade so early in the school year, and as we wanted an accurate check on the particular words used in the game, the best method of testing appeared to be oral recognition of words presented individually to the child. The validity of this method of testing words out of context has been established by Monroe (16) and it has been used by several investigators. All the children in the experimental and control groups were tested in this manner at the beginning of the experiment, at the end of ten days and at the end of twenty days. The test consisted of the 72 words on the flashcards for READ-O IA, presented one at a time. Interest was sustained by making a game of it, giving the child all the cards he could immediately recognize. All the testing was done by students especially trained for this method. At the end of the experiment the Devault Standardized Reading Test, Form I, was given to all the children to determine the relative progress of both groups in general reading ability. Every precaution was taken to equalize the conditions of both groups throughout the experiment. All instruction was done by the teachers under normal public school conditions. Possibly the first grade in the Training School was somewhat superior in intelligence and general advantages than the average public school; for this reason it was put into the control group.

Table I shows the results of Tests I, II and III. Both groups are normal in intelligence, with a slight advantage in favor of the control group; the P.E. indicates there is no significant statistical difference. Test I shows that at the beginning of the experiment the experimental group was slightly superior in sight vocabulary even though slightly handicapped in ability as measured by intelligence rating. This discrepancy might be explained by the fact that about 30 percent of the control group consisted of children in the Training School, above the average in intelligence but receiving less formal instruction during the first month of school than is usually given in the public schools. As the formal methods are introduced in the Training School after the first month or six weeks of school, the method should not materially affect the final results.

TABLE I

VOCABULARY TEST RESULTS, COMPARISON OF THE EXPERIMENTAL AND CONTROL GROUPS

		TEST I							TEST II							TEST III						
	Median I.Q.	No. Cases	Range	Median Score	P.E.	Q-1	Q-3	Q	No. Cases	Range	Median Score	P.E.	Q-1	Q-3	Q	No. Cases	Range	Median Score	P.E.	Q-1	Q-3	Q
Experimental	98± .927	148	0–52	5.63	.324	2.47	8.80	3.17	137	0–68	10.56	.578	5.50	18.70	6.60	137	1–72	21.67	1.333	11.50	34.50	12.50
Control	100±1.516	79	0–38	2.56	.288	1.16	5.25	2.05	76	0–29	5.66	.504	2.71	9.75	3.52	75	0–50	9.44	.754	5.05	15.50	5.23
Difference	2±1.77			3.07	.430	1.31	3.55	1.12			4.90	7.66	2.79	8.95	3.08			12.23	1.528	6.45	19.00	7.27
$\frac{D}{P.E.\ (diff.)}$	1.13				7.07							6.39							8.02			
Chances in 100	77				100							[illegible]										
% Overlapping				23																		

TABLE II

Comparison of Vocabulary Gain, Experimental and Control Groups

		First Ten Days							Second Ten Days							Total of Twenty Days						
	Median I.Q.	No. Cases	Range	Median Gain	P.E.	Q-1	Q-3	Q	No. Cases	Range	Median Gain	P.E.	Q-1	Q-3	Q	No. Cases	Range	Median Gain	P.E.	Q-1	Q-3	Q
Experimental	98± .927	137	0–28	5.50	.474	2.66	11.50	4.41	122	0–46	9.67	.594	4.39	16.33	5.97	135	0–64	16.78	1.038	7.75	27.06	9.66
Control	100±1.516	75	0–14	3.44	.333	1.44	6.06	2.31	71	0 38	2.19	.441	1.54	7.50	2.98	75	0–38	6.83	.689	2.70	12.25	4.78
Difference	2±1.77			2.06	.579	1.22	5.44	2.10			7.48	.733	2.85	8.83	2.99			9.95	1.245	5.05	14.81	4.88
																			7.99			
$\frac{D}{P.E._{(diff.)}}$	1.13				3.56							10.20										
Chances in 100	77				99							100							100			
% Overlapping				30							18							15				

$$\frac{4.78}{9.56} \qquad \frac{9.66}{9.56/10}$$

After ten days, the experimental group showed a wider spread and greater gain: the children playing READ-O gained from 5.63 to 10.56 words, while the control group gained from 2.56 to 5.66 words. Similar gains were shown by the first and third quartiles. The experimental group made a greater gain during the last ten days of the experiment by increasing the median score from 10.56 to 21.6, while the control group reached 9.44 or less than half the gain made by the experimental group. Even if we should assume that there is a difference between the two groups in rate of learning because possibly of different methods of instruction, and that the rate is three words less as indicated in Test I, the experimental group would still show about twice as much gain as the control group. As the experiment progressed the differences between the groups increased in favor of the experimental group. A study of the reliability of the differences indicates a significant statistical difference between the children who played READ-O and those taught by the regular school methods. The percentage of overlapping also shows the difference increases in favor of the experimental group. There were twice as many children in the control group who reached or exceeded the median of the experimental group at the beginning as there were at the end of the experiment.

Comparing the vocabulary gain in Table II and Figure I gives a clearer picture of the two groups. The median difference in the gain of the experimental and control groups during the first ten days is about two words, while the difference is over seven words at the end of the second ten days. Over the entire twenty day period the difference is nearly ten words, or over two and one-half times as great as the gain for the control group. This is verified by a study of the P.E.'s, the reliability of the differences, and further substantiated by a study of the quartiles and percentage of overlapping. With an increase in the number of days of practice, the difference between the groups increases in favor of the experimental group: the longer the children play READ-O the greater the difference becomes. The teachers in the experimental group observed that as the experiment progressed, interest in the game also increased.

TABLE III

VOCABULARY GAIN PER DAY

Groups	First 10 days	Second 10 days	Twenty Days
Experimental	.55	.97	.84
Control	.34	.21	.34
Difference	.21	.76	.50

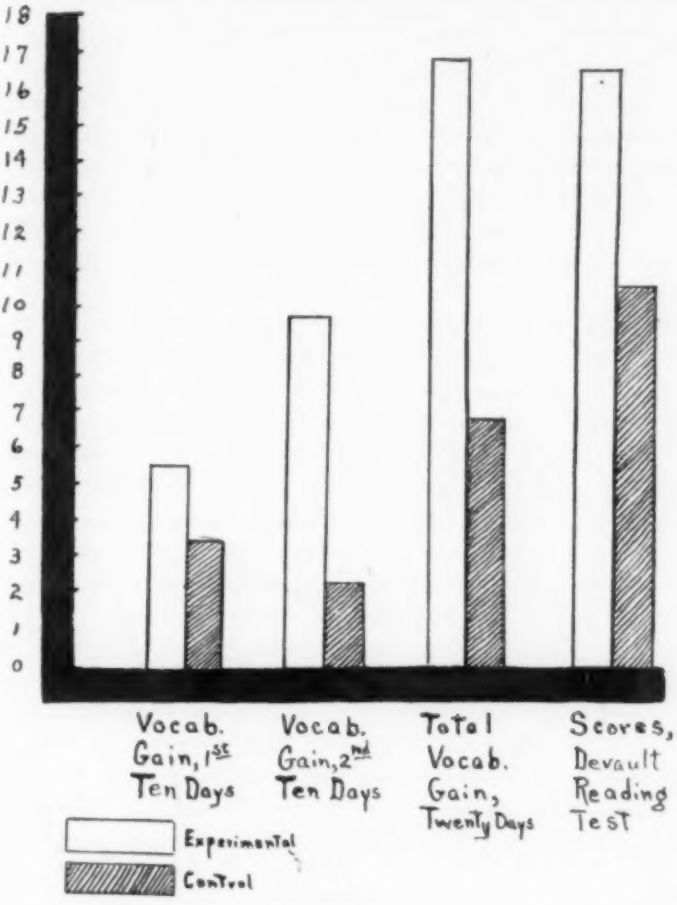

FIGURE I

COMPARISON OF GAIN IN VOCABULARY AND READING ABILITY OF EXPERIMENTAL AND CONTROL GROUPS

Table III shows the daily gain of the children in the experimental and control groups. During the first ten days the experimental group gained an average of .55 or slightly over one-half a word a day, while the control group gained about one-third of a word a day. For the entire twenty days, the experimental group made an average gain of .84 of a word a day, while the control group gained .34 each day. The control group gained less during the second ten days of the experiment than

during the first ten days. In view of the fact that these first 72 words are fairly common in the reading vocabularies of pre-primers and primers, it would seem that the ordinary methods of instruction do not furnish enough repetitions of these words to insure permanent learning and immediate recognition. More words were forgotten from one testing to the next by the control than by the experimental group, indicating that frequency of use is an important factor in learning the basic primary vocabulary. Other investigators have pointed out that to get the highest retention, new words should be reviewed within twenty-four hours after presentation (4).

Another picture of the vocabulary gain of the two groups is given in Figure II. Here the ogive, or cumulative graph, illustrates the frequency distribution of the experimental and control groups. The number of cases making no gain is less in the experimental than in the control group: about 6 percent of the children made no gain in the experimental group while 23 percent in the control group failed to make any gain. Q-1 in the experimental group equals and slightly surpasses the median of the control group, i.e., the lower 25 percent of the experimental group made as great a gain as the lower half of the control group. The median gain of the experimental group was around 16 words compared with 12 words gained by 75 percent of the control group. Q-3 or 75 percent of the experimental group equaled the gain made by approximately 95 percent of the control group. The difference in range is also shown by these graphs, indicated by the length of the curves. The greatest gain made by any child in the experimental group was 64 words compared with a maximum of 38 in the control group. Approximately 10 percent of the experimental group exceeded the greatest gain made by the control group.

TABLE IV

COMPARISON OF EXPERIMENTAL AND CONTROL GROUPS ON THE DEVAULT READING TESTS

	Median I.Q.	No. Cases	Range	Median Score	P.E.	Q-1	Q-3	Q
Experimental	98 ± .927	116	0–28	16.53	.546	11.00	20.40	4.70
Control	100 ± 1.516	64	0–22	10.50	.594	5.80	13.40	3.80
Difference	2 ± 1.77			6.03	.806	5.20	7.00	.90
$\frac{D}{P.E._{(diff.)}}$	1.13				7.48			
Chances in 100	77				100			
% Overlapping				10				

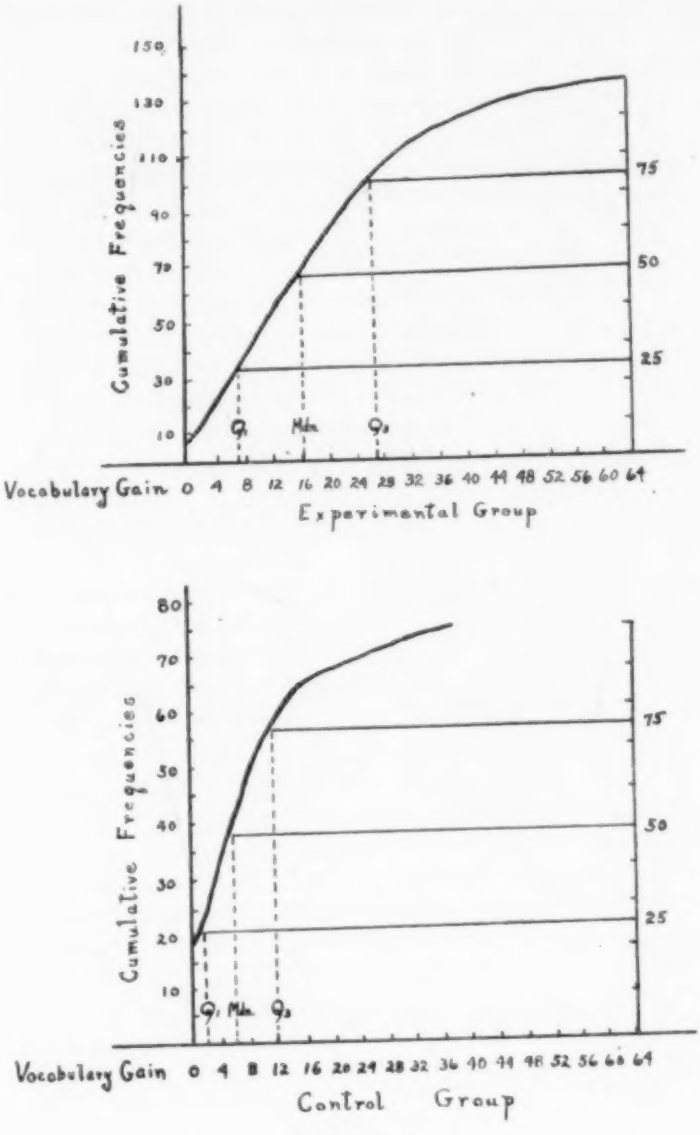

FIGURE II

FREQUENCY DISTRIBUTIONS SHOWING THE VOCABULARY GAIN OF EXPERIMENTAL AND CONTROL GROUPS

If a child gains in word recognition, does this help his general reading ability? The teachers of the experimental group observed that interest transferred from READ-O to other reading activities and also that there followed a marked improvement in general reading ability. At the end of twenty days the Devault Primary Reading Test, Form I, was given to both groups. Table IV and Figure I show a median score of 16.53 for the experimental group and 10.5 for the control group; a significant statistical difference of 6.03 in favor of the experimental group. A similar difference is indicated by the first and third quartiles. A study of the overlapping of the groups shows that only 10 percent of the control group reached or exceeded the median of the experimental group. The relationship of word recognition learned in the experiment to reading ability is further shown by the high positive correlations between the Devault Reading test scores and the vocabulary test scores:

Devault Reading test scores and vocabulary test I $r = .51 \pm .05$
Devault Reading test scores and vocabulary test II $r = .63 \pm .04$
Devault Reading test scores and vocabulary test III $r = .64 \pm .04$

An analysis of the words used in the Devault Reading tests shows that only thirty-six, or 50 percent, of the words used in the game of READ-O occur in Devault's test. If there is a high positive correlation with only half the words common to both, an increase of the commonality of words would give a still higher and more significant correlation between learning words through the game and ability to read as measured by the Devault Reading test. The results indicate a definite relationship between recognition of words and achievement in reading,—an important factor for primary teachers to consider.

In conclusion it seems that the fundamental value of the game technique used in this experiment lies in the fact that READ-O trains the pupil in habits of perception more effectively and with greater retention than the formal methods used by the average class-room teacher. The data indicate that a free-type method of informal instruction, when closely integrated with the curriculum and constructed so as to conform to the psychological principles of economical learning, definitely increases the rate of learning.

SUMMARY

1. The majority of teachers agree that play is valuable for motivation, and present tendencies in the new curriculum indicate a wider interest in

and more practical uses made of free-play activities as the basis for informal methods of instruction.

2. A number of the games used by classroom teachers are designed largely for entertainment and are limited in practical teaching possibilities.

3. This experiment was conducted to test the merit of informal methods of instruction and the efficiency of educational games for the improvement of primary reading.

4. The results show that children who play the game of READ-O as a supplementary reading activity in the classroom show greater vocabulary development than children taught by regular classroom methods.

5. There seems to be a high correlation between word recognition as learned in the READ-O game and general achievement in reading as measured by standardized reading tests.

6. It appears that the methods used by the average classroom teacher do not furnish adequate repetitions of the subject matter to insure permanent learning and immediate recall.

7. The results of this experiment indicate that informal methods based on free-play activities may be successfully used in the classroom for instructional purposes, and, when closely integrated into the curriculum, definitely increase the rate of learning.

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ACCURACY IN TESTING THE ARTICULATION OF SPEECH SOUNDS

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FREQUENTLY observations of speech-sound articulation have been reported, and more and more the data obtained are being treated statistically. In such studies, articulation tests are prepared for the purpose and administered to the subjects by an examiner who records the responses. In some instances, recordings are made by letter spellings and in others by phonetic symbols. The former method, fortunately, is fast falling into the discard, and at present no study using this procedure can be seriously treated. However, the phonetic transcription of responses, significant as this advance is, does not solve all of the problems involved in securing accurate and measurable data in the field of speech-sound articulation, for it is at once evident that the results of such studies are subject to errors in the examiner's judgment of the responses and to inconsistency of response on the part of the subjects; i.e., individual subjects may vary their responses on successive administrations of the test.

It seems that tests of speech-sound articulation should conform as nearly as possible to the requirements for other objective tests, such as intelligence and achievement tests; i.e., they should show satisfactory validity, objectivity, and reliability. However, articulation tests differ somewhat from these other tests for several reasons. First of all, the purpose (or purposes) in giving articulation tests differ to some extent from the purpose in giving either intelligence or achievement tests. In tests of speech-sound articulation, one is interested not only in a subject's relative rating on a numerical scale, as is the case in most other tests, but also in the exact types of errors made. In fact the latter objective is usually the more important of the two. Second, no definite objective standards for judging the responses can be set up because there is no well-defined limit as to what is right or wrong, since the recording of the responses is entirely dependent upon personal judgment. Third, there is as yet no practical way to secure a permanent record of the speech judged, and as a result it is difficult to check the extent of a given examiner's personal bias after a study has been completed. These facts, as will be shown in the following paragraphs, make it necessary to employ special techniques for determining the acceptability of articulation test results.

Heretofore, in studies of the articulation of speech-sounds investigators seem for the most part to have contented themselves with finding the coefficients of reliability, apparently assuming that such coefficients, if sufficiently high, indicate consistency in the responses of the subject adequate to establish the validity of the result, and consistency and objectivity in the examiner's judgments sufficient to guarantee the accuracy of the findings.[1] This, however, is not true as will be shown.

If an articulation test is to be valid, the exact articulatory productions, as recorded by the examiner, should represent a given subject's customary articulation of the sounds tested. Let us suppose that an examiner who is perfectly accurate in his judgments of speech sounds elicits the test word *bathe* and records a substitution of (v) for the final *th* sound. Now suppose he administers the test again and elicits the substitution (d) for the *th* sound. The coefficient of reliability will not be affected by this change in response, but it certainly would not be a valid conclusion to report that the customary substitution is (v). If such variation in responses were limited to only a few subjects, the conclusions in terms of exact substitutions would not be greatly affected, but if a great number of subjects were to manifest marked inconsistency of response, definite conclusions as to the substitutions made would not be valid. This point was well illustrated in a recent study made by the writer.[2] The coefficient of reliability (Pearson product-moment) of a test given on two successive occasions to sixty institutionalized children from three years, six months of age through the second grade was .97 ± .01 whereas that for the same test when administered to sixty institutionalized children from the third to the seventh grade, inclusive, was .92 ± .02. Since this difference was contrary to expectation, the respective pairs of records were compared for consistency of response, which procedure revealed that, although the scores were relatively constant, the exact errors noted varied much more for the smaller children than for the older ones. Since the examiner had previously shown by

[1] Poole furnishes an exception to this statement. She secured a statistical measure that includes both her consistency in judgment and the consistency of the subject's responses. It seems to the writer that these two measures should be kept separate, for there is no reason why a well-qualified examiner should not be allowed to proceed with a study even though an investigation of two successive sets of responses to the same test by the same subjects should reveal a high decree of inconsistency in the records. Perhaps this very inconsistency on the part of the subjects is a significant finding. Poole, Irene. *The Genetic Development of Consonant Sounds in Children's Speech.* Unpublished doctor's dissertation. University of Michigan, 1934.

[2] *A Study of the Articulation of Consonants by Normal Institutionalized Children.* Unpublished doctor's dissertation. University of Wisconsin, 1935.

experiment a rather high degree of consistency in judgment, this condition was probably due to the fact that the smaller children produced so few sounds correctly that the scores remained the same although the responses were changed. In such an instance, the validity of the test in terms of exact articulatory productions is so low that no definite conclusions are permissible except that the speech-sound patterns are, in general, very poorly established.

Suppose we take for granted, then, that any examiner will find the reliability of his test and attempt to determine the validity insofar as this is dependent upon consistency of the individual subject's responses. Two questions still remain: (1) Is such variation as may be noted between responses on two successive administrations of the same test to the same subject by the same examiner attributable to inconsistency of response or to inconsistency in the examiner's judgment? (2) Are the responses that are recorded the actual responses given, i. e., would other trained phoneticians agree with the judgments made by the examiner? The first question is related to the matter of validity, for if variations in the recorded responses are attributable to inconsistency in the examiner's judgments, a conclusion that the subjects are exceedingly variable in their responses would be erroneous. The first consideration in preparing to give a test, therefore, would seem to be the establishment of a satisfactory consistency in the examiner's responses. The second question has to do with the objectivity of the test. Since, as pointed out above, there are no completely objective standards for judging the responses and since it is impossible to check the extent of an examiner's personal bias after a study has been completed, there seems to be no way to determine that a test is objective except to establish by experiment before a given problem is undertaken that the prospective examiner is satisfactorily accurate in his judgments, i. e., that he agrees with other well-trained phoneticians both as to the correctness or incorrectness of the responses and to the exact productions in the responses judged to be incorrect.

In the writer's mind, then, four statistical measures should be established in connection with every test of speech-sound articulation before the results of such a test can be considered satisfactorily accurate. These measures are, in order of their determination: (1) the degree of consistency of the examiner's judgments, (2) the degree of objectivity in the examiner's judgments, (3) the extent of consistency of response on the part of the subjects, and (4) the coefficient of reliability of the

test. Pertinent facts gleaned from experience in determining these measures will be reported here.

Consistency of judgment can be established through the use of an electrical recording of the test words as produced by a subject who manifests markedly defective articulation. Using the same phonograph and a record form that provides for a separate record of each test unit, the prospective examiner may judge the reproduced speech on two successive occasions separated by a considerable interval of time. The record form may be prepared like one of the following, as illustrated by the use of the stimulus word "eat" in a test of both vowels and consonants: (1) eat __ __, or (2) $\underset{i}{__}$ $\underset{t}{__}$. When the two sets of judgments have been secured, they can be compared, item for item, and the percentage of agreement can be computed. The percentage thus secured would be the index of consistency of judgment as exhibited by the examiner. Since in such an experiment all variables except the judge are reduced to a minimum, it seems reasonable to demand a rather high percentage of agreement before an examiner be allowed to undertake a research problem. In her study of the speech of institutionalized children[3] the writer manifested a consistency of judgment on 98.2 percent of the items, and a coöperating judge showed a self-agreement of 90.2 percent. A small amount of research would quickly establish a standard that would be acceptable in the pursuit of research studies.

The establishment of objectivity in the examiner's judgment is a much more complicated process. Since in the above-mentioned study the writer's index of consistency of judgment seemed rather high, she proceeded to discover how accurate she was in her estimates of articulatory productions. Lacking any well-established technique with which to compare her findings, she undertook a meager study on the general subject of objectivity of speech sounds. A discussion of the procedure and findings is submitted here with the hope of stimulating more and better controlled research on the subject.

The study was initiated to determine to what extent several phonetically trained judges would agree upon the articulation of consonants as produced by subjects with markedly defective articulation. In pursuing the desired information, three different approaches were used. The same test words, involving one hundred sixty-seven consonant units, were used

[3] Op. cit., p. 30.

in all three procedures. The words were so chosen as to permit each of the twenty-three consonants to appear at least twice in each position—initial, medial, and final—in which they appear in the English language.

In the first experiment the subjects to be tested appeared in person before the judges. Two third-grade children who exhibited unusual abnormalities of articulation were given the test by the writer in the presence of two other phonetically trained judges. The writer, who also acted as a judge, elicited the test words by the presentation of objects, pictures, and parts of the body to be named, questions to be answered, and a few words to be repeated after her. Each of the three judges independently recorded the articulatory responses on a form which provided for a separate record of the production of each consonant unit. Insofar as possible each response was transcribed phonetically and omissions were indicated by a dash. The three records were then compared in order to determine the extent to which the three judges agreed with one another.

Speech over a microphone afforded the material used for the second experiment. A five-year old child from the speech clinic at the University of Wisconsin was given the test by an assistant. The two were seated by themselves before a microphone, and the three judges who served in the first experiment received the amplified speech in another room where they judged it as in Experiment I. The results were analyzed just as in the first experiment.

As a third experiment an electrical recording of the test words as they were produced by one of the coöperating judges was used. In making the record the speaker quite deliberately distorted both consonants and vowels, sometimes using sounds for which there are no definite phonetic expressions. The record was then judged separately by the writer and the second coöperating judge, and the two sets of judgments were compared and evaluated as in the first two experiments.

The results of the three different experiments were analyzed from two different points of view; viz., (1) agreement among judges in terms of the correctness and incorrectness of the responses, and (2) agreement among judges in terms of the exact recordings of responses. The former method takes into account those sounds that were judged to be incorrectly articulated and ignores the problem of exactly what each judge thought the subjects produced, whereas the latter plan involves the judgments of exactly what sounds were produced. The results of these analyses are given in Table I.

TABLE I

PERCENTAGES OF TEST UNITS ON WHICH THE VARIOUS JUDGES AGREED

Experiment	Agreement among Three Judges		Agreement between Respective Pairs of Judges		Disagreement of All Judges as to Exact Responses
	Correctness & Incorrectness	Exact Responses	Correctness & Incorrectness	Exact Responses	
I Speech of a Subject in Person	80	72	1 & 2...86 1 & 3...88 2 & 3...87	1 & 2...79 1 & 3...80 2 & 3...81	6
II Speech over a Microphone	69	60	1 & 2...84 1 & 3...78 2 & 3...77	1 & 2...69 1 & 3...75 2 & 3...75	10
III Speech Electrically Recorded	—	—	1 & 3...90	1 & 3...85	15

Although the numbers of subjects and judges used in the study are too small to warrant any very definite conclusions, a study of the data presented above makes certain statements possible:

1. Correctness and incorrectness of consonants can be judged more accurately than the exact articulatory productions themselves.
2. If seventy-five percent agreement, which is the commonly accepted criterion of objectivity in ratings of items whose evaluation depends upon personal judgment, be taken as a standard, correctness and incorrectness of consonants as articulated by subjects in person and in recorded speech possess a considerable degree of objectivity (a) when the judges have good hearing and (b) when the judges are practiced and expert in the detection of detailed speech sounds.
3. Fine distinctions of consonants, under many circumstances, possess a rather low degree of objectivity, but when the material to be judged is speech of a subject in person or speech electrically recorded, the articulatory productions are satisfactorily objective when judged by well-qualified persons.
4. Consonants transmitted over a microphone appear to possess a low degree of objectivity even from the point of view of correctness and incorrectness.

To those who have never questioned the objectivity of speech sounds, the above table may be a little surprising. However, when we consider the personal variables that may limit the extent of the judges' agreement, such as (1) the auditory sensitivity for certain frequencies in the speech range, (2) phonetic background, (3) experience in articulation testing, and (4) choice of phonetic expressions to express slightly non-

standard speech sounds, the results of these experiments are not remarkable.[4] Since all of these variables are more or less controllable, it seems that some effort should be made to reduce their influence to a minimum before any study of objectivity of speech sounds is made. Unfortunately, with the exception of testing hearing, these factors were not taken into consideration in making the experiment reported here.

Relative to future studies of this type that may be undertaken, the following suggestions are made: (1) By audiometric test each judge should manifest practically normal hearing before he is qualified to serve in the experiment. (2) Important differences between the phonetic backgrounds of the various judges should be reduced to a minimum by the use of a training period in which the judges independently transcribe the responses of several subjects and later discuss the symbols employed. (3) Each experimenter should participate in testing situations until he can make judgments with ease and can demonstrate considerable consistency in his judgments from one occasion to the next. (4) Certain modes of expressing recurrent non-standard articulatory productions should be adopted by mutual agreement during the training period.

It is regrettable that no extensive research has been done relative to objectivity in speech-sound articulation testing, for lacking well-established standards as to the extent of agreement that one might expect when several well-trained persons concurrently judge another's articulation, an individual desirous of testing his own objectivity in judging speech sounds is unable to interpret fully whatever data he may obtain from an experiment such as these presented here. The writer, therefore, recommends further that more extensive and better controlled research be done with two aims: first, to establish the best method for determining such objectivity; and, second, to set up standards with which future inves-

[4] In addition to these personal restrictions to agreement between judges, each method has factors inherent in itself which make for limited agreement. For instance, in experiments I and II the subjects were often asked to repeat a word in order that the judges might more accurately grasp which sounds were being used. Since the subjects were a little confused by being asked to repeat what seemed very plain to them, they often varied the productions during the repetitions. This situation frequently resulted in one judge's choosing one production for his final record while another judge hit upon some other. Experiments II and III have certain disadvantages not found in I; they are (1) the elimination of visible articulatory movements and (2) the distortion of frequency and intensity composition of the various articulatory productions. Such a reduction and masking of cues forces one to do a certain amount of guessing, and it is not probable that any two judges will guess the same in all instances. These uncontrollable factors make for differences between the extent of agreement in the several experiments and operate to determine the relative value of the technique to be used in future studies.

tigators in the field may compare their measures. In making such a study certain procedures would seem to be warranted; viz., (1) the use of more than three judges, (2) the use of the same subjects and the same test words for all experiments, (3) the qualification of all judges as to hearing ability, phonetic training, experience in testing including satisfactory consistency in judgment, and (4) the adoption of some scheme for expressing recurrent non-standard articulatory responses.

Once a prospective examiner is provided with a well-established standard of objectivity in articulation testing, he can arrange his own experiment under conditions similar to those used in securing the standard. In this way the percentage of agreement among the judges can be ascertained, and a comparison can be made between the judgments of each individual judge and those of the remainder of the group. Marked disagreement on the part of any individual judge should lead to a further study of the accuracy of his judgment, possibly to be followed by a repetition of the experiment. When the experiment is finally finished, the examiner can compare with the standard his percentage of agreement with the other judges in order to learn whether he is sufficiently accurate in his judgments to accept the responsibility of gathering data from which significant conclusions may be drawn.

Consistency of response can be determined by giving the same test to an adequate sample of unselected subjects—say one hundred—on two successive occasions not too widely separated in time. For this purpose the record form used in establishing the examiner's consistency and objectivity in judgment should be used. The two sets of responses should then be compared and the percentage of the total number of items on which there is agreement should be computed. If the examiner has previously shown a high consistency in judgment, the percentage of agreement found in this experiment may be considered the index of consistency of response by the subjects.

Since in any articulation test, each test item is usually presented several times, it will be necessary to use a second record form to find the scores from which the coefficient of reliability is found. The type of record used should provide for a composite of responses for each speech sound used which will readily yield to scoring. The results of the tests given for consistency of response can be transferred to this new record form for the purpose of scoring. The process is a bit cumbersome, but where many errors in articulation are made, it seems the only answer to the problem of determining both validity and reliability. Once the scores are ob-

tained, the coefficient of reliability may be computed by one of the well-known methods.

SUMMARY

1. Tests of the articulation of speech sounds are subject to errors in the examiner's judgment and to errors resulting from inconsistency of response on the part of the subjects.
2. Since, frequently, the chief object in giving an articulation test is to determine the exact types of errors made, it is necessary to employ certain peculiar techniques in order to guarantee the validity and objectivity of test results.
3. In order to establish satisfactory accuracy in the results of a test, the writer suggests that four statistical measures be determined: (a) consistency of the examiner's judgments, (b) objectivity in the examiner's judgments, (c) consistency of the subjects' responses, and (d) the coefficient of reliability. The first and third measures are related to validity, and the second measure is basic to the objectivity of a test.
4. Detailed techniques are suggested for the determination of the first three measures.
5. A limited study on the general subject of the objectivity of speech sounds is reported. From the data obtained, the following statement may be made, pending further study:
   a. Correctness and incorrectness of consonants as articulated by subjects in person and in recorded speech possess a considerable degree of objectivity (1) when the judges have good hearing and (2) when the judges are practiced and expect in the detection of detailed speech sounds.
   b. Fine distinctions of consonants, under many circumstances, possess a rather low degree of objectivity, but when the material to be judged is speech of a subject in person or speech electrically recorded, the articulatory productions are satisfactorily objective when judged by well-qualified persons.
   c. Consonants transmitted over a microphone appear to possess a low degree of objectivity even from the point of view of correctness and incorrectness.
6. It is recommended that extensive and well-controlled research be initiated by way of (a) determining the best technique for establishing objectivity in judgment and (b) setting up standards of consistency and objectivity in judgment.

SOME ASSUMED DETERMINERS OF TEACHERS' ATTITUDES

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THE sources of an individual's point of view on controversial, philosophic, educational and social issues have been variously sought in constitutional peculiarities of temperament, the accidents of personal experiences and the pressures exercised by organized groups upon their members. A deterministic psychology has not favored the notion that people's opinions about unresolved human problems have generally been reached by careful preliminary examination of all available evidence with the final judgment the inevitable outcome of the interplay of facts and relations. Instead it is held that an attitude—whether it be a broad general orientation or a specific response to a limited situation—is a function of the nature, history and affiliations of the organism, and consequently causally correlated with such factors.

An approach akin to that just described was used in organizing and interpreting the results of a national survey of the social attitudes and information of American secondary school teachers.[1] Assuming that we have a defensible measure[2] of the liberalism-conservatism of a given group of teachers, what fluctuations in this variable occur when instructors are classified according to other discriminable traits? Most of these assumed "correlates" may prove to be relatively unimportant influences, but it is only by searching along a fairly wide front that the truly decisive "forces" can possibly be revealed.

It seemed desirable to determine what effect, if any, the different sub-

[1] For a description of the tests used and a discussion of the basic findings, see Chapter 8 of *The Teacher and Society*, the first Yearbook of The John Dewey Society for the Study of Education and Culture, edited by W. H. Kilpatrick and published by Appleton-Century, 1937. The data in this paper rest upon a coast-to-coast sampling of about 3,700 returns out of 9,300 blanks distributed. The present discussion should be viewed as an extension of the earlier report.

[2] The "split-half" reliability of this attitude test is .94; of the information test, .93. There is no short way of designating the validity of the entire attitude test, for that is a function of the separate "validities" of the component items and their interrelations. The statements retained in this measure were first marked by a "criterion" group of eminent liberals and conservatives in American public life and also "item-analyzed" in terms of the responses made by a national sampling of almost four thousand junior and senior high school teachers. For a detailed treatment of this difficult problem, see the writer's "Homogeneity of Opinion Among Liberal Leaders," *Public Opinion Quarterly*, I, (1937), 75-78, and "The differential validity of items in a liberalism-conservatism test," to be published in the *Journal of Social Psychology* simultaneously with this paper.

jects of instruction have upon the beliefs of those who teach them as a means of livelihood. Since the statements to be judged deal mainly with problems in the political and economic spheres, the desirability of comparing social-science teachers with all other non-social-science instructors is strongly indicated. The subject-matter that one teaches is presumably a symptom of one's original preferences as well as an influential source of stimulation for one's further development. Table I gives the necessary figures for a first test of this view.

TABLE I

COMPARATIVE SCORES OF A SAMPLE OF SOCIAL-SCIENCE TEACHERS AND A SAMPLE OF THEIR COLLEAGUES IN OTHER AREAS WITH RESPECT TO LIBERALISM-CONSERVATISM IN SOCIAL ATTITUDES AND FACTUAL INFORMATION ABOUT PUBLIC QUESTIONS

Group	Variable	Mean Score	SD	N
Social Science Teachers	Attitude	69.78	14.84	70
	Information	57.54	15.80	70
Non-Social-Science Teachers	Attitude	67.90	14.15	163
	Information	39.60	18.20	163

Since the higher the "attitude" score, the more "liberal" the group, it is clear that instructors who are most directly concerned with controversial problems are somewhat more likely than others to move away from the conservative position. However, the critical ratio, i.e., "reliability" of the difference between the two means, is only .93, so that it would be improper to emphasize this point. With respect to knowledge, of course, there is a more substantial and dependable difference, the critical ratio here being 5.22. There is a mild tendency for better information to accompany greater liberalism—on independent grounds[3] we know that this can be expressed by a correlation coefficient of approximately .40. Evidently those who have the "facts" about social issues are a trifle more likely to be progressively-minded with respect to possible solutions for such difficulties; or, if one wishes, a person with a liberal outlook is more strongly motivated to acquire and retain certain relevant data.

In Table II are ordered the liberalism scores of instructors from various fields picked at random out of a national sampling. It is a little hard to find an explanation for the sequence here revealed as in some instances the figures support empirically-based expectations and in others they fail to do so. Why art and music instructors—who presumably have much in common—should be at opposite ends of the scale is a bit difficult to under-

[3] For confirming evidence, see the reference in footnote 1, especially pages 212-214.

TABLE II

SOCIAL ATTITUDES SCORES OF REPRESENTATIVE TEACHERS OF DIFFERENT SPECIALTIES (ARRANGED ACCORDING TO DESCENDING LIBERALISM)

Subject	Mean Score	SD	N
Foreign Language	71.45	16.60	173
Art	70.76	15.96	43
Home Economics	69.12	9.76	68
English	69.02	14.36	438
Science	67.56	13.80	258
Commercial Courses	67.04	13.76	184
Mathematics	66.84	14.12	309
Physical Education	65.04	13.92	67
Vocational Education	64.84	14.60	112
Music	61.56	15.28	35

stand. Conceivably "radical" propaganda is currently operating more effectively in the content of the plastic arts (cf. Rivera, Orozco, etc.), or the isolated conservatory tradition of the musician is working to his particular disadvantage in this sphere. The unexpected liberalism of home economics staff members may be a reflex of their nutrition studies and their recent rapprochement with social service workers.

TABLE III

LIBERALISM OF SECONDARY SCHOOL TEACHERS AS RELATED TO SEX AND MARITAL STATUS

Group	Mean Score	SD	N
Men			
Single	70.47	13.82	436
Married	71.42	15.31	1162
Widowed	78.00	——	11
Divorced	77.33	——	12
Women			
Single	67.42	13.38	1526
Married	70.00	15.95	261
Widowed	66.98	14.04	65
Divorced	66.78	14.24	41

Table III is of interest on at least two counts: first, its definite revelation of the greater liberalism of the male instructors, (perhaps due to their greater interest and familiarity[4] with political and economic matters), and second, the superior liberalism of both married groups to the single folks, particularly in the case of the women, where the critical ratio is 2.48 (with the men it is 1.27). It is known that marriage is symptomatic of a favorable biological selection and the circumstance here dis-

[4] The information median is 43.85 for the men and 36.95 for the women.

played may simply be another case of "good qualities going together." Why being divorced or widowed should move men teachers in the direction of greater liberalism and women instructors toward conservatism is one of the riddles of statistical inquiry that shows how little we know about the mechanisms involved in forming the spirit of tolerance.

TABLE IV

SOCIAL ATTITUDE SCORES OF TEACHERS WHOSE FATHERS BELONG TO DIFFERENT ECONOMIC CLASSES

Occupational Level	Mean	SD	N
Professional	69.13	13.88	371
Small proprietors (includes farmers)	69.25	13.26	998
Commercial	68.70	14.04	325
Skilled labor	70.20	14.08	883
Unskilled	68.70	13.21	113

Table IV was developed as a possible test of the view that one's economic antecedents condition one's social outlook. However, so far as one can tell from the telescoped data, there is a remarkable homogeneity of opinion among these teachers which seems in no wise related to the occupational roles of their fathers. Perhaps these teachers have breathed a common educational and cultural atmosphere so long that the presumptive initial differences have vanished. Instructors whose parents were in the ranks of unskilled labor—certainly near the bottom of the income ladder—are among the least liberal or most conservative of the social classes. At any rate, these figures give no support to the claim that early life in poor and underprivileged families (= "proletariat") creates a pronounced bent toward radicalism; indeed, the contrary is more likely to be the case. An oversimplified economic determinism appears to have misled many observers at this point.

A further test of this type of economic determinism is presented in Table V. Presumably a teacher's social sensitivity is intensified by the number of dependents—chiefly children—he has. Aid in the maintenance of necessitous relatives was a prominent feature of the depression and has probably always characterized the teaching profession with its relatively stable income. Nevertheless, the data fail to buttress this familiar assumption. A teacher with no dependents or with but one—say a wife or child—is as liberal as any of his associates who provide for bigger families. Progressivism is evidently not a function of large households!

The final factor for which we have been able to accumulate evidence in this study concerns the effect of non-teaching occupational experience

TABLE V

ATTITUDE MEANS OF TEACHERS WITH A VARYING NUMBER OF PERSONS DEPENDENT UPON THEM FOR SUPPORT

Number of Dependents	Mean	SD	N
0	68.00	13.36	144
1	69.35	13.27	78
2	64.77	14.34	49
3	63.74	12.79	29
4	68.76	——	17
5	68.60	——	5

upon the index of liberalism. One of the questions on the personal data sheet asked, "At what occupations other than teaching have you worked for at least six months?" Many experimental teacher-training programs exhibit a belief that contact with other (usually "humbler") occupations exercises a liberalizing influence upon the prospective teacher. It is assumed that having learned "how the other half lives" his sympathies and understandings will correspondingly be broadened. Although the *kind* of occupational experience is plainly of paramount importance, the demands of quantification made it necessary to consider only the *number* of different non-teaching jobs held.

TABLE VI

SOCIAL ATTITUDE SCORES OF TEACHERS WITH VARYING AMOUNTS OF NON-TEACHING OCCUPATIONAL EXPERIENCE

Number of Different Jobs Held at Least Six Months	Mean	SD	N
0	67.49	12.73	198
1	71.71	15.27	73
2	64.20	14.43	33

The evidence of the averages on this point is none too clear, but if the increased variability is weighted it seems that a *slight* amount of non-teaching vocational activity *may* be an aid to the development of the liberal temper. The dose, however, must be small, for if teaching is to be the individual's primary concern, he plainly cannot spend too much time profitably in other areas. Sponsors of new departures in the professional preparation of teachers will do well to keep this in mind.

It would be a mistake to view the tabular material of this account as other than a rough preliminary clue to some of the factors which make one teacher a progressive and another a conservative. Teachers, like other citizens, differ widely in their opinions about mooted social, political,

economic, educational, and artistic matters. For a variety of reasons, some cling contentedly to the old and others passionately pursue the new. Some of these influences—perhaps exceedingly minor ones—have been studied here, and while all the preceding tables with their small differences need to be used cautiously, they contain acceptable evidence indicating that liberalism as an attitude in the field of human relations is most readily found among men teachers, among married teachers regardless of sex, and among instructors having few or no dependents. The sampling of teachers here employed is believed to be representative of the profession in the United States today. Specific selective factors probably account for some findings—e.g., the greater progressivism of the married teachers is not due to the effect of marital status as such, but to the fact that the abler and more alert teachers are somewhat more likely to be married. In general, our data do not so much show what experiences make for liberalism among teachers as what liberal teachers tend to do.

EDITORIAL

A YEAR OF ACCOMPLISHMENT THROUGH COÖPERATION AND COÖRDINATION

AT THE end of the year a well-managed business takes an inventory. Although few such occasions since 1929 have been a signal for congratulations and rejoicing in business or educational circles, there seems to be an optimism of the human spirit that will not be repressed permanently.

At the end of 1937 it is appropriate to take stock of educational accomplishments, especially in terms of coöperative and coördinated investigations. This statement is no reflection on the approximately three thousand graduate theses produced annually in education or on the large number of other individual research projects worked out by professors and field investigators. The independent worker has made large contributions to education and will continue to do so, but the complexity and scope of many problems in the social sciences have increased to such an extent that satisfactory solutions are to be found only in studies adequately supported, staffed, and coördinated.

No previous year in educational history seems marked by so large a number of coöperative undertakings, in spite of the fact that earlier years have included large scale or national surveys or studies of secondary education, teacher education, school finance, social studies, child health and protection, social trends, character education, modern foreign languages, Latin, reading, adult education, and genius. Much of the financial support has come from the Carnegie Foundation for the Advancement of Teaching, General Education Board, and the federal government. Among the coördinating agencies are the American Council on Education, National Society for the Study of Education, United States Office of Education, Research Division of the National Education Association, and the Social Science Research Council. The scope of the programs of investigation mentioned below is suggested by the funds made available, in excess of two million dollars for the five Office of Education projects, and in certain other instances from a half million to a million dollars.

The five major projects of the Office of Education are: forums, university research, vocational education for Negroes, radio education, and

organization of local school units. The President's Advisory Committee on Education made its report at the end of the year. The Social Science Research Council has published a series of thirteen research monographs concerned with as many social problems (including education) in relation to the depression. The monograph on education was prepared by the Educational Policies Commission of the National Education Association, which also sponsored Beard's *The Unique Function of Education in American Democracy*. An American Youth Commission of the American Council on Education is in the midst of its five-year program of study. The Committee on Revision of Standards of the North Central Association has published its findings in seven volumes. A Coöperative Study of Secondary School Standards for the six regional accrediting agencies is near completion. The Committee on the Orientation of Secondary Education has presented to the Department of Secondary School Principals its two reports on the issues and functions of secondary education. Another report of the International Examinations Inquiry appeared early in the year in the form of Kandel's *Examinations and Their Substitutes in the United States*.

Generous support has been given by the General Education Board to the work of the Progressive Education Association: Study of College Success, and the Commissions on the Relation of School and College, on Human Relations, and on the Secondary School Curriculum. More than one half of the states in 1937 were engaged on more or less extensive curriculum programs. During the year the Commission on the Social Studies of the American Historical Association completed publication of its sixteen volumes. Although the American and Canadian Committees on Modern Languages from 1927-1931 published a total of seventeen monographs and a summary of the reports, unfinished and new projects required sponsorship, which has been and is being given by a committee on modern languages of the American Council on Education. The Regents' Inquiry into the character and cost of public education in New York State is virtually completed, as is the nine-year Carnegie study of secondary and higher education in Pennsylvania. Of the 1937 yearbooks, space permits mention of only five: the National Society for the Study of Education on reading and on international understanding, the Department of Superintendence (American Association of School Administrators) on the improvement of education, Department of Elementary School Principals on appraising the elementary school program, Department of Supervisors and Directors of Instruction on the changing cur-

riculum, and the National Society of College Teachers of Education on the use of background in the interpretation of educational issues.

It is suggested that the reader who wishes to keep in touch with such projects as these may do so through the various departments of the *Journal of Educational Research,* especially through the section devoted to Research News and Communications. Merely to page through the numbers of the *Review of Educational Research,* which has just completed its seventh year, may prove a stimulating experience, although not all of the literature cited is research, and not all of the research summarized is good research. It is possible that caustic and destructive criticism of research findings and procedures, as well as fatalistic pessimism concerning the future of education, has been overdone, even though the cauterizing effect may have been beneficial. The evidence of the foregoing educational inventory suggests to the worker in college or field that he face the new year with a wholesome pride in his calling, with a reasonable confidence in the body of evidence upon which the profession rests, and with a sincere appreciation of and respect for the service rendered education through the large-scale coöperative and coördinated projects of recent years.

CARTER V. GOOD

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

RHINE, JOSEPH B. *New Frontiers of the Mind* (New York: Farrar and Rinehart, 1937), 275 pp. $2.50.

To describe the Duke University experiments on telepathy and clairvoyance to a lay audience Dr. Rhine has written *New Frontiers of the Mind*. To one who comes upon it as his first reading in this field, the book may well seem to be an extremely good and convincing popularization of a large body of carefully performed experimental work. The misty blue paper jacket with "mind" in smoky green letters creates a striking first impression of the book. The story is simply told and one's interest is aroused and maintained by the rising drama of the Duke discoveries. But if one has read Rhine's *Extra-sensory Perception* (his "detailed scientific report of the ESP research"), and the other publications from the Duke laboratory, as well as the criticisms and check experiments of other investigators, one knows some of the defects in the work: the lack of adequate experimental control, the gross over-estimation of the statistical significance of some scores, the tendency to explain away low scores, the contradictions and errors which appear in Rhine's writings, the possibilities of clerical errors, sensory cues, and rational inference, and the possibilities of conscious or unconscious dishonesty in the subjects. If one knows these defects, it is difficult to think of *New Frontiers of the Mind* without also thinking of them. But it is not necessary to review them all in detail here. In the January, 1938 issue of the *American Journal of Psychiatry* and the *American Journal of Sociology* are well-documented reviews of the whole field by Wolfle and Gulliksen respectively. These reviews offer detailed evidence in support of criticisms that can only be outlined here.

Rhine devotes the first three chapters of *New Frontiers of the Mind* to giving the setting for his experiments. The book starts with a question: "As human beings, what are we? What is our place in nature?" The recognized sciences, Rhine writes, have not given us the answer. He doubts if they ever can and turns instead to search among the unrecognized and unusual fields. Work in extra-sensory perception is, needless to say, the field in which he hopes it will appear. Chapter II relates a number of anecdotes on telepathy of the type which every college teacher of psychology is accustomed to having introduced with the question: "How do you explain this?" In Chapter III the earlier work of Mesmer, Barrett (the Creery sisters case), Richet, and Coover; the work of Gardner Murphy and G. H. Estabrooks under the direction of William McDougall, and Upton Sinclair's *Mental Radio* are all reviewed.

Chapters IV, V, and VI are devoted to a narrative account of Rhine's own work on clairvoyance. Rhine writes of how he, with his colleagues Lundholm and Zener, started out to investigate the alleged extra-sensory phenomena, of how they first secured negative results, of the

development of the technique of asking the subjects to name, sight unseen, the designs on packs of cards containing five cards of each of five suits (plus sign, circle, rectangle, star, wavy lines), of the appearance of significant results when these cards were used, of how Lundholm and Zener withdrew "because of pressure of other duties," of the excitement when one subject ran nine straight hits, of the greater excitement when he got 21 correct out of a series of 25, and of the long series of trials under varied conditions with Linzmayer, Stuart, Pearce, and the other star performers.

Chapter VII—The First Serious Criticism—discusses the problem of evaluating scores to determine whether or not they can be explained on the basis of chance success. Upon one point there is fairly general agreement. Even Stuart, Rhine's assistant, is now agreeing with Rhine's critics that his experimental conditions violate the assumptions underlying the probability theories which he has used to evaluate his data. However, a proper evaluation of Rhine's data on clairvoyance would still show statistically significant scores—scores which might or might not be due to clairvoyance but which certainly are not due to chance. Rhine's statistical errors in evaluating tests of telepathy were much more serious, and some scores which he has called highly significant may well be due to chance (cf. Kellogg, *Scientific Monthly*, October, 1937).

In Chapter VIII Rhine decides that sensory cues from the cards could play no role in explaining his subject's scores. He found, for example, that they did as well on new decks of cards as they did on old ones and so concluded that the cards could not have been marked. Recently Dr. B. F. Skinner at Minnesota has made the amazing discovery that the symbols on cards *supplied by Rhine* to Dr. Baker (who was attempting to repeat at the University of Minnesota some of Rhine's experiments) could be read from the backs. In printing the symbols, the ink has caused the cards to shrink, producing a slight impression on the back of each which corresponds in shape to the symbol on its face. If one looks squarely at the back of a card, or if one tries to look at a light through the card, the markings are invisible. But if light is reflected at the proper angle from the back of the card, the depression can be seen and the card can be read without difficulty. A newer pack of ESP cards, furnished with "Compliments of your Zenith Radio dealer" is much less plainly marked. I made only 34 hits in my first 50 calls with these cards. This score, however, has the slightly significant "X" value of 8.48. Under less favorable lighting conditions, or with a subject who had not consciously recognized the existence of the marks but who was nevertheless occasionally responding to them, scores similar to those made by Rhine's subjects could easly be duplicated.

The only adequate way to exclude these cues is to use techniques in which the subject can neither see nor touch the cards. Rhine refers to some tests where these conditions were met (126-128) but he fails to give the total number of trials involved.

When it is known that the cards are marked, some of Rhine's statements provide interesting reading. In designing the cards, Rhine sought to "select forms as unlike as possible, even in their parts" (48). The most common experimental technique allowed the subjects to "stare at the back of the card" (59). After these cards were developed "the tests for clairvoyance—began to give indications that the research was on the right track"

(62). In *Extra-sensory Perception* we learn that the use of letters and figures on the cards was given up "partly because it was quite laborious, and partly because of indications of failure" (35), and that "the best results were obtained with the 5-symbol cards" (53). In the directions supplied with the packs of cards, subjects are told to "take the pack in one hand, carefully holding it face down and try to get an impression of which symbol you think it matches." Unsuccessful subjects are further instructed: "If your total score for four runs should not be above twenty, however, it would be better to try another test method or to try other conditions or another time." Again, in *New Frontiers of the Mind*, Rhine writes: "the cards . . . which we are now using, and which have been made available to the general public, have been modified and improved from the original designs" (49). The improvements seem to have consisted of simplifying the figures and printing them in bolder outline.

With each pack of cards comes a statement that they are "for the purpose of testing the until recently unrecognized powers of the mind commonly called hunches, intuitions, and mind-reading." Since the cards are marked on the backs, some of the tests described in the directions are of no value. In *New Frontiers of the Mind*, Rhine takes a different view of the lay use of his cards. Such distribution, he writes, "does no one any harm, is commonly of good entertainment value, and . . . (develops) powers of observation" (240). The markings on the cards of course enhance these virtues. Under good conditions one can, as a stunt, call off all 25 correctly with ones eyes so nearly closed that spectators will not know they are open. But what will happen when everyone learns the trick? Will interest in ESP decline as it did in mah-jongg, miniature golf, and monopoly?

The work of other laboratories is reviewed in chapter IX. The only reference to the studies with negative results published by Willoughby, Cox and Baker is the statement: "So far as I know only three have failed to confirm (Rhine's conclusions), and those are the three series conducted with the least regard for the Duke procedure. They were not done under the direction of anyone with experience in this difficult field" (143). In four or five other places Rhine describes the technique as simple, easy, or ideally suited for *student* research.

Chapter X discusses the work on telepathy and devotes some half dozen pages to distinguishing between clairvoyance and telepathy. "It was not possible to choose the symbols from anything objective or else we might have a basis for an alternate interpretation — possible clairvoyance" (162). Thus the agent could not select a card from the pack and look at it or write down the order in which he intended to "send" the images. But a hundred pages earlier (opposite p. 60) Rhine includes a photograph illustrating a telepathy test in which the sender is staring at a card. In the copyrighted directions for telepathy tests which accompany the cards, the sender is instructed to pick up the deck and concentrate on the first card. True, in both cases the test is referred to as a "telepathy-card test," but if this name is meant to distinguish it from an ordinary telepathy test, Rhine is merely adding confusion to his distinction between telepathy and clairvoyance.

The chance for clerical errors, mistakes and illusions is fairly large in the conditions under which the telepathic series were run. Even Rhine found that the average score dropped five points per

series of 25 when he had an independent recorder check the calls made by Zirkle, the receiving member of the Ownbey-Zirkle team, the chief telepathic subjects. Rhine is inclined to attribute this drop in score to the fact that Miss Ownbey had recently become Mrs. Zirkle (167). Nevertheless in *Extra-sensory Perception* Rhine recommends the use of young married couples as among the best for study of telepathy.

The final six chapters discuss the general mental setting of the work, the fact that ESP cannot be explained as a wave phenomenon since it does not obey the inverse square law, the question of who has extra-sensory perception, the many letters he has received from a variety of correspondents, the problem of time in extra-sensory perception, and his plans for the future.

Rhine finds a dilemma in the problem of time. Telepathy, he writes may really be clairvoyant pre-cognition of what the agent will write down when he makes a record of the symbol which he has been sending. Conversely, clairvoyance may actually be a telepathic pre-cognition of the thought which will be in the experimenter's mind when he looks at the card to check the subject's call. Just how to untangle these difficulties, Rhine does not state, but he does "feel that it is not too much to say that this may be the greatest question science has ever investigated" (254).

From the standpoint of an unbiased and unemotional search for knowledge, the wisdom of publishing *New Frontiers of the Mind* may be questioned. Aided by the distribution of Rhine's patented ESP cards and record pads, and by a popular press which has, for the most part, accepted Rhine's work at his own evaluation, it has had the effect of selling extra-sensory perception to an eager public before the scientific world has been convinced of the soundness of the work. Less hurried popularization would have allowed time for other investigators to study the problem, for more thorough analysis of the questions involved, for criticisms to be offered and evaluated. If the work survived such analysis and criticism there would still be an opportunity for popularization; if it failed to survive, no scientist would want to popularize it.

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OGAN, R. W., BIXLER, L. E., CLARK, PAUL E., and OTHERS. *A College Looks at Its Program* (Columbus: The Spahr & Glenn Company, 1937), pp. x + 326. $3.00.

One of the most stimulating activities in which one may engage is a serious, critical analysis of his own activities. This is equally true of a group as well as an individual. Perhaps it is particularly true of a group engaged in teaching, whether at the elementary, secondary, or college level. The stimulus to improvement which comes out of proper dissatisfaction with what one is doing makes for progress. A critical analysis of one's activity is almost certain to result in some dissatisfaction.

This volume records in part some of the activities, experiences, and results of such a critical examination of the activities of a group of earnest faculty members in a small liberal arts college. Various phases of college life came under such critical scrutiny. Administration, curriculum, testing, teaching methods, aims, and objectives are all included in one or more reports in this volume.

Some of the experiments are professedly too limited in scope to yield generalizations. They were not too limited in

scope, however, to be stimulating to the individuals involved in the study nor are they too limited to be suggestive to others who are facing similar problems.

The report is characterized by a clarity of writing, a simplicity of presentation, a harmony of organization which makes it readable and at the same time provocative of thought.

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OGAN, R. W., BIXLER, L. E., CLARK, PAUL E., and OTHERS. *A College Looks at Its Program* (Columbus: The Spahr & Glenn Company, 1937), pp. x + 326. $3.00.

This is an account of how the faculty of a rather typical liberal arts college (Muskingum, Ohio) of some eight hundred students engaged in a coöperative study of its major problems. The moving spirit presumably was the dean of the college and chairman of the editorial committee, R. W. Ogan, assisted by R. W. Tyler of Ohio State University who visited the Muskingum campus over a period of six years as research adviser, beginning in 1930 when the faculty decided to study its problems more systematically and continuously. The concepts underlying the program of investigation have their origin in the ideal of democracy, with emphasis on coöperative study of college problems by approved research methods rather than to follow the doctrine of authoritarianism in reaching decisions. Such a program is facilitated through critical faculty discussion of each study, systematic and sustained effort, protection and encouragement of individual initiative, research advisers, guest speakers, special library facilities, encouragement of publication, and adjustment of faculty service loads. The investigations themselves, together with some of the subject fields represented, are grouped as follows: experimental studies (geology, Bible, chemistry, and history), testing (voice improvement, English composition, and musical talent), objectives (social science, biology, speech, and English), curriculum supervision (preparation of elementary teachers, and composition), character education, and administration (job analysis of the office of dean of women, residence distribution of students, marking, and social regulations).

While the studies are of unequal value in terms of objective evidence, scientific procedure, and application to situations in other higher institutions, the program of investigation is more than justified in terms of solution of local problems and faculty improvement. Publication of the studies is decidedly worthwhile, possibly not so much for the actual investigational results reported as for the service rendered through a concrete illustration of a coöperative program for faculty stimulation, in-service training, and improvement. How much better it is to adopt some such plan than to follow traditional procedures with no attempt at evaluation or to make minor modifications on the basis of untested assumptions of various staff members, or to accept and advertise without real evaluation some promising innovation as the solution of all the difficulties of the liberal arts college.

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WILLIAMS, JESSE FEIRING and SHAW, FANNIE B. *Methods and Materials of Health Education* (New York: Thomas Nelson and Sons, 1935), pp. VIII + 331. $ 1.65.

The literature in the field of health education has lagged considerably behind the development of the field itself. In this book by Dr. Williams and Miss Shaw the educational world is presented with a

thorough-going and competent discourse upon the various phases of school health work which should be of considerable practical assistance to those administrators and teachers who feel the need of guidance in the development of their programs.

The scope of the book is wide and its contents understandable and helpful. To begin with the authors have wisely defined terms and from the definitions suggested (which, incidentally, have been officially accepted by the American Physical Education Association) the reader can get a clear picture of the various administrative sub-divisions such as health service and health instruction. At the same time he will be informed of the fact that such terms as "medical inspection" and "school hygiene" have outgrown their usefulness. This chapter on definitions serves to clarify terminology and thus equip the educator with a language which is simple and clear.

From that introductory chapter the text describes at once the nature of the child in a compact, concise, and thorough analysis of child life and the influences which bear upon it. If today's education begins with the child then every teacher should be aware of the progress of his development, his biological growth, the relation of the organic parts, the nature of disease processes, the factors influencing development, and, the emotional nature of this organism. These matters are set forth with clarity and understanding and the reader has the confidence that the material is scientific.

The school influences the child not only in the classroom but continuously throughout the day. Its influence, furthermore, is more than mind-affecting alone. These realities are commonplace to most now but in these succeeding chapters the authors have shown us how these influences can be organized, how they can be administered so that the relation of school life to the health of the child can become more than a merely happenstance thing. Teachers want suggestions on curriculum construction, or testing and measuring, and principally, perhaps, on material for classroom use. The discussion of these matters in this book are sound, and useful, and presented with authority and wisdom. Other chapters on the role of official and non-official health agencies, and on the health of the teacher complete the book.

The merit of the book is a reflection, of course, of the professional skill of its writers. The senior author, Dr. J. F. Williams, is Professor of Physical Education at Teachers College of Columbia University and is so well established in the joint area of physical education and health education as to be rightfully considered eminent as an authority on the health of the school child. Miss Shaw, the junior author, brings to the book a rich and thorough experience as a field worker and teacher. She is now attached to the staff of the National Tuberculosis Association as a field worker in health education.

The book will prove useful for both teachers in the field and in training. The chapters have outlines at the beginning and review questions at the end. The index is complete and in all respects the book is to be recommended as a definite contribution to our knowledge of education and its processes.

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JONES, GALEN. *Extra-Curricular Activities in Relation to the Curriculum.* Contributions to Education, No. 667 (New York: Bureau of Publications, Teachers College, Columbia University, 1935), pp. xi + 99. $1.60.

Extra-curricular activities, as defined by the author of this book, are negatively characterized by three traits. They are not on the regular schedule; they *receive no credit leading to graduation;*[1] they are not carried on in accordance with a prescribed course of study. We must note, however, that the "activity period" is not considered by him as a part of the regular schedule, and that a "suggestive outline of procedures" is not regarded as a course of study. In view of the author's limitations on the first and third traits and his use of italics for the second trait, the essential characteristic of extra-curricular activities for him seems to be found in the refusal to give them credit leading to graduation.

The study might, therefore, better be named "Non-credit Activities in relation to Activities Which Receive Credit toward Graduation." The term *curriculum* may then be used, as the author thinks it should be used, to include "all the activities and experiences provided by the school."[2] Thus the ambiguous term *extra-curricular* will be avoided. The final sentence in the book when restated in these more precise terms becomes, "The progressive secondary school uses the whole life of the school for educative purposes, and is unconcerned whether the desirable outcomes are the results of activities which receive credit toward graduation or of non-credit activities."[3]

To the reviewer this whole attempt to distinguish between credit and non-credit activities is of little importance. The use of credits in secondary education is merely a bookkeeping device which has unfortunately been allowed to determine the whole philosophy of education at this level. The essential characteristic of the so-called extra-curricular activities is to be found in the freedom which can and should be allowed to the pupils for initiating, planning, executing, and evaluating these activities. In the regular activities in the classroom the primary responsibility must rest with the teachers, but in clubs, assembly, athletics, publications, musical organizations, dramatic organizations, and student council the primary responsibility should rest with the pupils.

For those who may be concerned with the question of credits for student activities outside the regular activities of the classroom this book gives a well-written report of practices in 1934. Briefly summarized, the trend is to give credit toward graduation for work on the newspaper, for membership in musical organizations, and for participation in dramatics and debating. On the other hand, athletics, assemblies, clubs, and student council will apparently remain on a non-credit basis.[4]

With the exception of Table VII the headings of the tables are clear and adequate. The statistical treatment of the data makes effective use of the critical ratio technique. In Table V an error of fact occurs. One school reports that basketball was introduced before 1890, but Dr. James A. Naismith invented the game in 1892. In this same table an error of computation is found. The first quartile year for introduction of the magazine should be 1902 instead of 1900.[5]

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[1] Italics used by author, p. 6.
[2] p. 46.
[3] p. 89.
[4] p. 69.
[5] p. 17.

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BADANES, SAUL. "Are the New York Schools Retarding Mental Development and Democracy?" (Flushing, N. Y.: Comet Press, 1937), 13 pp.

The author emphasizes the fact that the school can help the growth and development of democracy if the school's aim is sociological in character and provided that it is felt in all phases of education.

CARR, WILLIAM G. "Improving Social Studies Instruction," *Research Bulletin of the National Education Association*, XV (Washington: National Education Association, November, 1937), 69 pp.

Data based upon 1764 replies to a questionnaire submitted to teachers of social studies is compiled and discussed on the basis of: objectives, content of the program, methods and aids in teaching, dealing with controversial subjects, and the local community as an area of study. Bibliographies of standard tests, texts and supplementary books are given.

COOKE, DENNIS H. "How Do Teachers Rate Themselves?" *Reprint from September, 1937, Educational Administration and Supervision*, 4 pp.

The author studied the self-ratings of 217 teachers as compared with principal's ratings, the Coxe-Orleans Prognosis Test of Teaching Ability, and an Aptitude Test for Teaching. He finds few significant correlations.

HOLY, T. C. "The Disposition of School Bond Issues and Special Levies Submitted in Ohio School Districts Between January 1 and November 2, 1937, Inclusive," *Bulletin of the Bureau of Educational Research* (Columbus: Ohio State University, November, 1937), 23 pp. Mimeographed.

This bulletin tabulates the disposition of school bond issues and special levies for both those submitted in Ohio city and Ohio county school districts.

JONES, J. W., Editor. "Abstracts of Unpublished Masters' Theses," *The Teachers College Journal*, VIII (Terre Haute: Indiana State Teachers College, 1937,) 37 pp.

This bulletin supplies abstracts of unpublished Masters' theses at the Indiana State Teachers College, from August 1935 to June 1937.

SHINN, E. H., CHR., AND OTHERS. "A Further Study of Certain Techniques Used to Individualize College Teaching in a Selected Group of Land-Grant Institutions," *Bulletin of the United States Department of Agriculture, Extension Service* (Washington: United States Department of Agriculture, 1937), 34 pp.

The purpose of this study is to show what a group of agricultural colleges are doing to provide certain kinds of special treatments to meet individual differences of students. Bibliography.

WOODS, MARY TENISON. "Juvenile Delinquency," *Bulletin of the Australian Council for Educational Research* (Melbourne: Melbourne University Press, 1937), 80 pp.

The author discusses the general problem of delinquency and then the existing situation in Australia with recommendations for after-care and prevention of delinquency.

WRIGHT, BARBARA H. "When Pupils Leave School," *Bulletin of the Division of Instruction, Minneapolis Public Schools* (Minneapolis: Division of Instruction, October, 1937), 16 pp.

This bulletin contains reports on high school graduates a year after graduation and on pupils finishing junior high school.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

FLORY, CHARLES D., AND WEBB, JAMES F. "Cumulative Records for Elementary Schools," *The Elementary School Journal*, XXXVIII (December, 1937), pp. 278-290.

Cumulative record forms are given as suggestions to administrators who are trying to evolve satisfactory systems of records.

KNOX, WILLIAM F. "An Investigation of the Length of the Elementary School Day," *The Elementary School Journal*, XXXVIII (December, 1937), pp. 291-295.

On the basis of data gathered by questionnaire from eighty elementary schools, the author forms a typical school day for elementary pupils.

REAVIS, G. H. "The New Ohio High-School Standards," *Educational Research Bulletin*, XVI (Columbus: Ohio State University, December 8, 1937), pp. 225-235.

A syllabus discussing the new high-school standards for the state of Ohio.

METHODS OF TEACHING AND LEARNING

DAVIS, H. CURTIS. "Improving Reading Ability of High School Seniors," *California Journal of Secondary Education*, XII (November, 1937), pp. 424-429.

The author reports an investigation in improving the reading of high school seniors through instruction, and finds that the gain in comprehension of the instructed group represents a two-year gain for the average child.

HILLIARD, GEORGE H., AND TROXELL, ELEANOR. "Informational Background as a Factor in Reading Readiness and Reading Progress," *The Elementary School Journal*, XXXVIII (December, 1937), pp. 255-263.

On the basis of data secured about 66 kindergarten children, who were studied through grade two, the authors conclude that, other factors being equal, children with rich backgrounds are more strongly equipped to attack the printed page than are pupils of meager backgrounds.

CURRICULUM

COWLEY, E. B. "Ratio and Proportion in High School Curriculums," *School Science and Mathematics*, XXXVII (December, 1937), pp. 1079-1088.

The purpose of this article is to study the high school pupils' grasp of relationship of measurable quantities as revealed by the understanding of ratio and proportion. The author examined mathematics, physics and chemistry texts; articles by teachers in the field; and a questionnaire sent to pupils, to determine the

importance of this concept in the high school curriculum.

GOLDSTEIN, PHILIP. "Student Laboratory Work Versus Teacher Demonstration as a Means of Developing Laboratory Resourcefulness," *Science Education*, XXI (November, 1937), pp. 185-193.

The author attempted to find out whether allowing students to do laboratory work is a better way for them to develop laboratory resourcefulness than is teacher demonstration, and concludes that the former is the best.

CHILD DEVELOPMENT

DARLEY, JOHN G. "Scholastic Achievement and Measured Maladjustment," *The Journal of Applied Psychology*, XXI (October, 1937), pp. 485-493.

The author concludes that measured maladjustment and radicalism may depress achievement below the expected level, unless it is affected by some counterstimulant.

MEASUREMENT, STATISTICS, AND SCIENTIFIC TECHNIQUES

SAFFIR, MILTON A. "A Comparative Study of Scale Constructed by Three Psychophysical Methods," *Psychometrika*, 11 (September, 1937), pp. 179-198.

A comparison is made between the scales constructed by the Method of Paired Comparison, Rank Order, and the Method of Successive Intervals.

WISEMAN, EDITH C. "A Project for the Evaluation of School Broadcasts," *Educational Research Bulletin*, XVI (Columbus: Ohio State University, December 8, 1937), pp. 238-9.

The author discusses the project for the evaluation of school broadcasts, now being carried on at Ohio State University.

NEW TESTS

BAYROFF, A. G. "Quizzes on Dashiell's Fundamentals of General Psychology," Chicago: Houghton Mifflin Company, 1937.

This battery which consists of twenty-two objective tests, one on each chapter of Dashiell's Fundamentals of General Psychology. The test aims to provide a comprehensive measure of the student's knowledge of the subject.

DURRELL, DONALD D. "Durrell Analysis of Reading Difficulty," Yonkers-on-Hudson: World Book Company, 1937.

A battery of individual tests in oral and silent reading, supplemented by a check list for observation and record of faulty habits and inadequate skills in the different reading abilities. Suitable for grades 1-6.

DURRELL, DONALD D., AND SULLIVAN, HELEN BLAIR. "Durrell-Sullivan Reading Capacity and Achievement Tests," Yonkers-on-Hudson: World Book Company, 1937.

The Reading Capacity Test is a group test for measuring the child's capacity to learn to read in terms of his ability to understand spoken language and is composed entirely of pictures. The Achievement Test is a group test which may be used independently to give an analytical measure of reading achievement. Both are suitable for grades three to six.

ENGEL, ANNA M., AND BAKER, HARRY J. "Detroit Beginning First-Grade Intelligence Test," Yonkers-on-Hudson: World Book Company, 1937.

This is a revision of the Detroit First-Grade Intelligence Test, and is built upon the use of the earlier test and on research with 10,000 Detroit first-graders. The manual for this non-reading test provides reliable norms, gives careful directions for interpreting, and shows that the validity of the test has been increased.

McCALL, WILLIAM A., AND HERRING, JOHN P. "A Comprehensive Test Program," Chicago: Laidlaw Brothers, 1937.

A series of four tests consisting of an Intelligence Test; an Educational Background Questionnaire, which aims to measure aspects of educatibility not measured by intelligence tests; a Comprehensive Achievement Test to measure desirable learnings; and a School Practices Questionnaire which evaluates school practices. The battery is suitable for grades from four through nine, and norms are given for each test.

"Study Exercises in Reading and Arithmetic for Grades 5 to 8," Bloomington: Public School Publishing Company, 1937.

The aim of these study exercises is to find those opportunities by which the thinking power of the pupil is increased; the exercises are presentations of pupil experiences and discussions away from school situations.

TYLER, HENRY T., AND KIMBER, GEORGE C. "Tyler-Kimber Study Skills Test," Stanford University: Stanford University Press, 1937.

The test provides eight separate measures of skills and understandings of study techniques, and is suitable for use in high school and college.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

DOCTORS' THESES UNDER WAY IN EDUCATION, 1937-1938

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This is the eighth annual list of Doctors' theses under way in education to be published in the January number of the *Journal of Educational Research*. The present list includes only the titles which have not been printed in the January, 1935, 1936, and 1937 numbers of the *Journal*. Therefore, in order to make a reasonably complete canvass of doctoral studies under way at present, it is necessary to examine these four lists, 1935-38.

Completed dissertations may be discovered through canvassing the annual bibliographies of research in education, published by the United States Office of Education, and through *Doctoral Dissertations Accepted by American Universities*, published annually by the H. W. Wilson Co. As reported in the latter publication, the number of Doctors' degrees in education awarded during 1935-36 was 294 and during 1936-37 was 290. The doctoral theses for all fields during 1936-37 totaled 2709. The number of educational titles reported in the Wilson publication is rather consistently smaller than in the Office of Education annual bibliography of research; the latter has listed for education nearly 400 doctoral dissertations annually for a number of years in the past.

Each year certain of the titles cause one to marvel at the breadth of the field of education, as it is interpreted by at least some institutions, for example: "The Effects of Acid-and-Base Forming Diets on the Calcium, Phosphorus, and Nitrogen Metabolism of Children," "Regional Study of Southern Illinois," "Horace Walpole as Literary Critic," "A Study of the Validity of Some Cardio-Vascular Tests," "A Study of Co-defendants in Major Crimes," "David Belasco," and "Correlation of Sugar Proportion and Altitude Levels (With Applications in Home Economics Education)."

In all cases the name of the student, thesis title, and graduate institution are given, and in most instances the major adviser or advisory committee is listed. No differentiation is made in this compilation between Ph.D. and Ed.D. problems.

The institutions which have sent titles for inclusion in the 1937-38 list are: American University, Arizona, Boston College, Boston University, Bryn Mawr, Buffalo, California, Catholic University, Chicago, Cincinnati, Clark, Colorado, Colorado State College of Education, Columbia, Cornell, Duke, Fordham, George Washington, Harvard, Illinois, Indiana, Iowa, Johns Hopkins, Kansas, Kentucky, Louisiana, Marquette, Michigan, Minnesota, Missouri, Nebraska, New York, North Carolina, North Dakota, Northwestern, Ohio, Oklahoma, Oregon, Peabody, Pennsylvania, Penn State, Pittsburgh, Rutgers, Southern California,

Stanford, Syracuse, Temple, Texas, Virginia, Washington, Western Reserve, Wisconsin, and Yale.

After a lapse of several years and at the request of users of this compilation, a topical index of the titles again has been prepared. An effort has been made to classify each title under one or more appropriate headings; for example, "A History of Negro Land-Grant Colleges" is placed under both "Higher Education" and "History of Education." The numeral in the index refers to the corresponding number in the alphabetical list of candidates.

As in other years, such special fields as art, foreign languages, home economics, and music have been studied relatively infrequently in doctoral theses. Those areas receiving most attention are easily apparent, on examination of the index.

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NEW 1937-38 LIST

1. Abernethy, Thomas J. "Homogeneous versus Heterogeneous Grouping in 10th Grade Biology." Boston University. Billett.
2. Acosta, E. V. "Organization of Education in South American Countries." North Dakota. Overn.
3. Afflerbach, Calvin Eugene. "State Supervision Relative to the Transportation of School Children in Delaware." Brown. New York.
4. Aiosa, Anthony. "A Comparison of Identical and Fraternal Twins, One Member of Whom is Delinquent, for the Purpose of Determining the Forces Operating." Johns Hopkins. Stephens.
5. Alderfer, Clement J. "Administrative Procedures Involved in Changing Emphasis in an Elementary School Program." New York. Speer.
6. Allen, Robert M. "Factors in Success and Failure on Parole." New York. Benson.
7. Alteneder, Louise E. "The Value of Intelligence, Personality, and Vocational Tests in a Guidance Program." New York. Benson.
8. Altman, Sylvia. "Study of Aspects of Personality of Professional Children and Adolescents at Radio City (Comparison of Professional and Non-Professional Groups through Objective Tests and Individual Study)." New York. Benson.
9. Amsden, Maurice Ralph. "The Development of a Diagnostic Scale for the Measurement of Scientific Attitude." Stanford. Anibal.
10. Anderson, Almar S. "Community Conflicts in Relation to Superintendents of Schools." New York. Thrasher.
11. Anibal, Earle Warner. "The Financial Administration of Organized Campus Activities in Publicly Supported Teachers Colleges and Normal Schools." Columbia. Evenden.
12. Appel, Madeleine Hunt. "A Study

of Aggressive Behavior of Young Children." Bryn Mawr.

13. Archerd, F. S. "Health and Physical Education in Small School Systems." Colorado State College of Education. Troxel.
14. Arnold, Dwight. "Effect of Instruction in the Use of Data on the International Attitudes of Elementary School Children." Ohio. Tyler.
15. Atkinson, A. M. "Research Procedures in Administration, Measurements, Higher Education, History of Education." Pittsburgh. Buckner.
16. Atkinson, Carroll. "State Administration of Education by Radio." Peabody. Hamon.
17. Attebery, Clara. "A Curricular Problem in Home Economics for Teacher Preparing Institutions." New York. Winning.
18. Ave, H. C. "The Causes of High School Failures." Colorado State College of Education. Wrinkle.
19. Bain, Wilfred C. "The Significance of the Status and Function of the A Capella Choir in the Colleges and Universities of the United States." New York. Hesser.
20. Baker, Robert W. "Occupational Information Pertinent to the Needs of Senior High School Students Who Do Not Expect to Attend College." Missouri. Germane.
21. Barker, Constance. "A Study of the Meanings and Attitudes Associated with the Socio-Economic Terms Used by Children." Columbia. Jersild.
22. Barnard, Laurence W. "A History of Theological Education in the Baptist Denomination in the United States of America." New York. Creager.
23. Barr, C. F. "The Use of Visual Aids in Secondary Schools." Pittsburgh. Buckner.
24. Bass, W. W. "The Educational Needs and Interests of High School Graduates." Colorado State College of Education. Rugg.
25. Beebe, B. F. "The Feasibility of Reducing Transportation Costs in New York State Through a Reallocation of Administrative Control." Cornell. Butterworth.
26. Benkert, Joseph. "Health Instruction in the Pennsylvania Senior High School." Pittsburgh. Gould.
27. Benne, Kenneth. "The Concept of Authority, with Special Attention to Its Logical and Methodological Aspects." Columbia. Raup.
28. Benz, Margaret G. "Possible Functions of a Family Counseling Service (as Shown by an Analysis of the Requests for Service Made of the Family Consultation Bureau of the Child Development Institute of Teachers College, Columbia University, 1932-36)." Columbia. Meek.
29. Beery, George S. "A Code for the Transportation of High School Pupils in Wisconsin." Wisconsin. Fowlkes.
30. Bender, Paul F. "A Study of Some Factors Affecting the Appointment of Prospective Teachers of Physical Education." New York. Lloyd.
31. Benton, Beulah I. "Contributions of Certain Leaders to the Development of Higher Education in the South, 1875 to 1900." Johns Hopkins. Bamberger.
32. Berens, Joanna S. "The Relation between the Health Education Program and the Health Needs of New York City." New York. Payne.

33. Bernard, Harold. "The Content of Social Science Survey Courses in Junior Colleges." Northwestern.
34. Berns, Karl. "Legal Relationships of Public School Teachers." Ohio. Lewis.
35. Blanchard, Leslie. "The Significance of the Tendency to Individualize Education at the College Level." Columbia. Kilpatrick.
36. Bloom, Royal. "Indices for Rendering Comparable the Marks of Transfer Students from Various Institutions of Higher Education." Minnesota. Douglass.
37. Bogardus, Helen Evelyn. "Determining a Criterion for an Acceptance of Under-Aged Children in the First Grade." Harvard. Dearborn.
38. Bollinger, Russell V. "A Study of the Influence of the Teacher upon the Social Behavior of the Pupils." Wisconsin. Barr.
39. Bond, Eva Mae. "A Study of Reading Techniques in Relation to Scholastic Achievements in Grade Nine." Columbia. Gates.
40. Bookwalter, Caroline Weems. "A Study of the Relationship between Stability of Mental Growth and the Physical Ability and Capacity of Children." Indiana. Patty.
41. Bookwalter, Karl W. "A Critical Evaluation of the Application of Some of the Existing Means of Classifying Boys for Physical Education Activities." New York. Lloyd.
42. Bowman, Neal B. "The Need for a Commercial Pharmacy Curriculum." Rutgers. Blackburn.
43. Boyce, Jessie. "The Reliability and Validity of a Comprehensive Qualifying Examination in Mathematics at the University of Minnesota." Minnesota. Douglass.
44. Boyington, Gladys. "Teaching of History in the Secondary Schools of Germany." Columbia. Johnson.
45. Bradford, Leland P. "The Effects of Practice on Some Phases of Memory." Illinois.
46. Bradshaw, Cleve R. "Youth and Social Security, A Report on Youth Unemployment and Relief in Michigan and the Activities of the National Youth Administration and Other Youth Agencies." New York. Zorbaugh.
47. Bramhall, Edwin W. "An Experimental Study of Two Types of Arithmetic Problems." New York. Drushel.
48. Brandenhoff, Harold P. "Criteria for the Organization of School Fiscal Units in Wisconsin." Wisconsin. Fowlkes.
49. Braun, Edward J. "Criteria for the Organization of School Administrative Units in Wisconsin." Wisconsin. Fowlkes.
50. Brennan, Alice Marie. "Conscious Development of Thinking in the Learning Process in the Field of Geography." Columbia. McGaughy.
51. Breternitz, L. A. "The Organization, Administration, and Staff Personnel of Selected Three, Four, and Six-Year High Schools." Colorado State College of Education. Troxel.
52. Brigham, James G. "The Validation of Objectives of Bookkeeping Education." Pennsylvania. Weaver, Peters.
53. Briones, Ignacio Tabuno. "A Study in Language Learning." Indiana. Somers.
54. Brock, John D. "A Study of Certain Psychological Traits as Related to Accomplishments in College." New York. Lloyd.

55. Brown, Dorph. "Curricular Development in Junior College." Colorado. Davis.
56. Browne, Sister M. Dorothy. "Phonics as a Basis for Improvement in Reading: An Experimental Study in Supervision." Catholic University. Johnson.
57. Brueggerhoff, Anna Marie. "Occupational Survey of the State of Washington." Washington.
58. Buegel, Hermann F. "An Experimental Comparison of Four Different Levels of Ideational Content on the Memory Span and Learning of Serial Motor Performances." North Dakota.
59. Burch, Willa Carter. "Clinical Practices in Public Schools." Pennsylvania. Garver.
60. Burckel, Christian E. "An Experiment in Organization for Adult Education." Columbia. Brunner.
61. Burr, Henry L. "The Training of Naval Officers Before the Founding of the U. S. Naval Academy." Temple. Kuehner.
62. Busby, Elden B. "The Orientation of Students Coming Into Senior High School from Junior High Schools." Stanford. Kefauver.
63. Carlson, Gustave E. "Characteristic Differences in the Teaching Performance of Good and Poor Teachers in the Social Studies at the Junior High School Level." Wisconsin. Barr.
64. Carr, Arthur. "The Life and Educational Influences of Samuel Lewis." Western Reserve. Robinson.
65. Carroll, Jane M. "Comparison of the Effectiveness of a Teachers College Training School and a Public School in the Same Town." George Washington.
66. Carrothers, C. C. "Construction and Use of Source Units in Curriculum Reorganization." Ohio. Alberty.
67. Carson, Robert. "The Writers and Writings of the Opposition to the Government of England from 1727 to the Fall of Walpole." Michigan. Cross.
68. Cassell, Mabel. "What Measures Children Know and Why." Boston University. Wilson.
69. Chaffee, Charles E. "The Evolution of School Supervision and Administration in Pennsylvania under the County Superintendent." New York. Meredith.
70. Chandler, John R. "The Organization and Functions of State Departments of Education." Oklahoma. Bender.
71. Chapman, A. L. "An Analysis of Course of Study Objectives." Texas. Ayer.
72. Chapman, Oscar. "A History of Negro Land-Grant Colleges." Columbia. Reisner.
73. Chatterdon, Hester. "An Appraisal of Cooperative Research in Home Economics." Ohio. Tyler.
74. Chinnock, Eugene. "A Comparative Study of the Educational Views of Plato in the *Republic* and in the *Laws*." New York. Horne.
75. Christensen, C. J. "How Important Is the School-Owned Garage as a Factor in Determining the Transportation Costs in the State of New York?" Cornell. Butterworth.
76. Church, Alfred Madison. "The Study of China and Japan in the American Secondary Schools." Harvard. Wilson.
77. Clark, Weston. "The Radio and Its Effect upon the Activities of Children." George Washington.
78. Claxton, Porter. "Rural Teacher Training in Rural Life Arts." Peabody. Frost.

79. Clifton, L. L. "The Prediction of Success in Algebra." Colorado State College of Education. Heilman.
80. Clock, Lucile. "Case Studies of Personality Difficulties of Elementary School Children." Wisconsin. Barr.
81. Clugston, H. A. "The Evolution of Research Methods in Education." Colorado. Davis.
82. Coleman, Susan. "A Study of the Activity Curriculum at the Primary Grade Level." Wisconsin. Barr.
83. Cooper, Charles D. "The Reactions of Sixth Grade Children to Commercial Motion Pictures as a Medium for Character Education." Cornell. Moore.
84. Copeland, J. Dewberry. "A Proposed Course of Study for First-Year Bookkeeping in Florida High Schools." New York. Tonne.
85. Couey, Frederick. "Developmental Possibilities of Junior High School Pupils in Terms of Curriculum." Washington.
86. Covello, Leonard. "The Social Backgrounds of the Italian School Child." New York. Thrasher.
87. Crawford, E. Winifred. "Factors Involved in the Supervision of Visual Education in a Suburban Community: A Study Based on the Experience and Research of a Director of Visual Education." New York. Knowlton.
88. Crow, Ralph E. "A Study of the National Youth Administration in Cuyahoga County High Schools." Western Reserve. Allen.
89. Curry, John J. "Guidance in the Eighth Grade Elementary School." Boston College.
90. Daggett, Clay J. "An Experimental Study of the Apprentice System for the Training of Teachers." Wisconsin. Barr.
91. Dahl, James A. "The Administration of the Danish-folk-school and Adaptation to American Needs." North Dakota. Overn.
92. Dame, J. Frank. "Naturalism—Its Meaning and Its Influence upon Education." Temple. Kuehner.
93. Daniel, Walter Green. "Economic Problems of Negro College Students." Columbia. Bagley.
94. Daniels, Virginia. "Factors Determining the Vocational Choices of Negroes." Pittsburgh. Hutson.
95. Daugman, John. "Shotsky's Educational Philosophy and Its Influence on Soviet Education." Pennsylvania. Woody.
96. David, Bert B. "Contributions by the Pennsylvania Germans to the Social Heritage of the United States." New York. Brown.
97. Davis, Norma Jessie. "The Effects of Acid-and-Base Forming Diets on the Calcium, Phosphorus, and Nitrogen Metabolism of Children." New York. MacArthur.
98. Daw, S. E. "Reading Vocabulary in the Grades." Pittsburgh. Yoakam.
99. Dean, Ray Bartlett. "Individual Instruction Practices in the Elementary Schools of America." Stanford. Almack.
100. Dearborn, Errol. "Student Guidance in the Selection of Extra-Class Activities in Teachers Colleges." New York. Suhrie.
101. Deboer, John J. "Investigation of Children's Reactions to Radio Programs." Chicago.
102. DeChantal, Sister Mary. "An Analysis of the Responses of Slow Learning Pupils to Certain Exercises in Percentage." Michigan. Schorling.
103. Demay, Amy Janette. "A Study of the Teaching of Fractions in the

United States, 1600 to 1935." New York. Drushel.

104. Dennis, Lindley H. "The Development of Vocational Education Associations in the United States." George Washington.

105. Diebolt, Alfred L. "Educational Trends in Clinton County, New York State, 1890-1937." New York. Andrews.

106. Dieterich, H. R. "Progressive Practices in Community-School Relationships on the Secondary Level." Ohio. Eikenberry.

107. Dillingham, Howard. "Factors to Consider in Establishing Junior Colleges." Syracuse.

108. Dillow, Konrad C. "English Educational Theories During the 18th Century." Illinois.

109. Dodson, Dan. "Protestant Religious Trends of New York City, 1900-1936: Causes, Correlates, Consequences." New York. Payne.

110. Doig, Leroy L. "High School Activities and Abilities as Predictive Factors in Junior College." Southern California. Hull.

111. Doshay, Lewis J. "Significance of Early Sex Offenses to Later Life Behavior Among Males." New York. Benson.

112. Dotson, George Edgar. "The Admission and Retention of Students at San Diego State College." Stanford. Kefauver.

113. Dotter, A. D. "Standards for School Buildings Housing Twelve Grades." Cornell. Butterworth.

114. Drake, Joseph F. "Occupational Interests and Opportunities as Determinants in the Construction of Curriculums for a Negro Land-Grant College in Alabama." Cornell. Stewart.

115. Drake, Richard. "The Effect of Teaching Algebraic Vocabulary and Concepts upon Achievement in Ninth Grade Mathematics." Minnesota. Boardman.

116. Dubois, Rachel Davis. "Building American Culture: A Report of an Experiment in Intercultural Education." New York. Thrasher.

117. Dunn, Eleanor M. "Health Misconceptions of Seventh, Tenth, and Twelfth Year Elementary and High School Students, and College Freshmen and Sophomores." New York. Lloyd.

118. Dyer, Joanna Thayer. "The Influence of Rhythm Capacity in Determining Degree of Motor Capacity." Columbia. Brownell.

119. Eaves, Robert W. "The Social Backgrounds of an Elementary School." George Washington.

120. Eberhardt, Charles J. "The Relationship of Certain Measurements to Ability in an Athletic Sport Event Involving Sustained Physical Effort." New York. Lloyd.

121. Edge, L. G. "The County Superintendent as a Supervisor." Colorado State College of Education. McKee.

122. Edgerton, Avis. "Health Claims in Advertising with Special Reference to the Beliefs of Women Consumers." New York. Nash.

123. Eichel, Charles G. "The Relative Effectiveness of Teaching Current History with the Aid of Organized Sound Films and the Usual Methods of Classroom Instruction in Current History." New York. Radosavljevich.

124. Ely, Sister M. Aimee. "The Youth Problem as Affecting the Education of the Catholic Girl." Catholic University. Johnson.

125. Endicott, Frank S. "Selection, Advisement and Teacher-placement in Schools and Colleges of Education in Universities." Northwestern.

126. Epler, Stephen. "Persons Honored by Certain Higher Institutions of Learning in the United States at Different Periods." Columbia. Counts.
127. Evans, C. M. "Survey of Negro Education in Missouri." Ohio. Davis.
128. Evans, Frederick H. "Factors Underlying Achievement in Secondary School Physical Science Courses." Columbia. Findley.
129. Fahey, George L. "The Relationship of Pupil Progress and Various Other Factors to Classroom Questions." Wisconsin. Corey.
130. Farnsworth, Philo. "An Historical Study of the Factors and Influences That Effect the Adaptive Process in Education." Columbia. Mort.
131. Faulkner, Ray. "An Experimental Investigation Designed to Develop Tests to Measure Art Understanding and Appreciation." Minnesota.
132. Fee, Mary. "Value and Function of Grammar Instruction in Language Usage and Reading." Kansas. Turney, Nash, Hankins.
133. Fink, William L. "Evaluation of the Various Types of Commencements in the American Secondary Schools." Pennsylvania. Grizzell.
134. Finnessy, John J. "A Proposed Policy of Providing Laboratory-School Facilities and Experiences on the Pre-Service Level of Preparation for Teaching in the Elementary Grades in the State of Vermont." New York. Suhrie.
135. Fisher, Dorothy A. "A Study of the Needs and Educational Practices Essential to the Success of a Natural History Museum in a Small Community." Cornell. Palmer.
136. Fisher, John J. "The Extent to Which Certain Elements of Teaching Equipment Contribute to Teaching Success as Represented by Measurable Changes in Pupils." Columbia. Evenden.
137. Fite, Mary D. "The Social Standards of Young Children as Related to Their Behavior in a Social Situation." Columbia. Meek.
138. Florence, Charles Wilbur. "Teacher Training as a Function of Negro Land-Grant Colleges." Harvard. Holmes.
139. Frazier, Francis P. 'A Study Relating to Methods of Selecting a School Committee." Boston College.
140. Fredenburgh, F. Alvah. "An Analysis of Theories of Personnel Service in Education for the Period 1900 to 1936 as a Basis for the Establishment of Trends." New York. Reed.
141. Frederickson, Clark. "A Descriptive Study of a Local Boys' Club in New York City. New York. Thrasher.
142. Free, L. Forrest. "The Philosophical and Educational Views of Henri Bergson." New York. Horne.
143. French, John Sprout. "The Bringing of an Emotion into the Focus of the Individual's Attention as a Means of Emotional Control." Columbia. Kilpatrick.
144. French, Milton Leroy. "Professor Lapper's New Method of Teaching Modern Languages: Composition, Comparison, and Critical Evaluation." New York. Radosavljevich.
145. Friar, Ethel H. "The Psychology of Non-Readers." New York. Benson.
146. Fuller, Carles G. "Why Men Leave the Ministry." Columbia. Swift.

147. Furie, William B. "Jewish Education in Russia and Poland before 1765." Boston University. Davis.
148. Fusfold, Irving. "The Relation between Auditory Deficiency in Children of School Age, Grades V to VIII, and Their Ability in Reading and in Use of Written Language." Columbia. Frampton.
149. Gager, W. A. "The Function of Mathematics in the Junior College." Peabody. Wren.
150. Galbreath, M. B. "The Discovery of Administrative Policies in Vocational Education in Agriculture According to Statement of Practice Expressed in the Five-Year Plans." Cornell. Stewart.
151. Garman, Emma. "A History of the Wagner Institute of Science." Temple. Kuehner.
152. Gaudin, Albert. "The Pedagogy of Charles Rollin." Columbia. Reisner.
153. Gellenthien, Elvira J. "Efficiency of the College Preparatory Function of Private and Public Secondary Schools, as Evidenced by Student Records at the University of Chicago." Chicago.
154. Gibson, Thomas Ray. "The Selection of Procedures for Course of Study Construction in Health and Physical Education in Public Schools." Columbia. Williams.
155. Gogate, Rajaram V. "A Study of Education in the Indore State with Critical Recommendations for Reconstruction on Democratic Lines." Columbia. Russell.
156. Goldfarb, William. "Children Who Do Not Talk." Columbia. Pintner.
157. Goodell, Myron R. "The Prediction of the Teaching Efficiency of Rural School Teachers." Wisconsin. Barr.
158. Gossard, Arthur P. "Administrative Provisions for Backward and Superior Pupils in the Public Schools of Ten Large Cities." Chicago.
159. Gotham, Raymond E. "Personality as a Factor in Teaching Success." Wisconsin. Barr.
160. Gould, Arthur. "An Inquiry into the Causes of Illness of Teachers in Los Angeles, the Effect upon Their Work, and Implications for Selection and Administration of Teacher Personnel." Southern California. Burton.
161. Gould, S. E. "Personality Traits of Young Children." Colorado. Davis.
162. Graff, O. B. "A Program for Improving the Professional Training of the Secondary School Principal." Ohio. Eikenberry.
163. Grant, Ernest A. "Proposed Program for Teacher Training for Negroes in Alabama." Cornell. Stewart.
164. Gray, Gumborg B. "Effect of Process on Solution of Verbal Problems in Arithmetic." Pittsburgh. Young.
165. Graybeal, Lyman B. "A Proposed Plan for the Administration of Supervised Student Teaching in New York University." New York. Borgeson.
166. Greenberg, Jacob. "General Intelligence and Its Relation to Achievement in Foreign Language Study in the Junior High Schools of New York City, Including a Diagnosis of the Elements in Language Study Which Cause Failure." New York. Tanner.
167. Gregory, Leslie Roscoe. "The Measurement of State Educational Reporting." Columbia. Engelhardt.
168. Gregory, W. Edward. "Unit Costs

in Large Private Schools." Harvard. Spaulding.

169. Grose, C. H. "Public School Budgeting Procedures." Pittsburgh. Yeager.

170. Gunn, Henry Martin. "A Study of School Board Procedure in a Western City." Stanford. Hand.

171. Haar, Eva C. "Education as Reflected in Eighteenth Century English Romances." Johns Hopkins. Bamberger.

172. Haggard, E. M. "The Disappearance of French Syllable Stress between Chaucer and Spenser." Peabody. Roehm.

173. Hall, E. Emerson. "Regional Study of Southern Illinois." Peabody. Parkins.

174. Hall, Lawrence K. "The Induction Experiences of College Graduates Entering the Secretaryship of the Young Men's Christian Association." Columbia. Elliott.

175. Hankwitz, Anita. "An Approach to the Teaching of Harmony in American Colleges and Universities According to Modern Educational Needs." Columbia. Dykema.

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